The UNESCO Courier
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SAHEL
Land of no return?

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TREASURES OF WORLD ART

International Women's Year

98 *Mexico*

The green goddess

Kneeling in the manner of an Indian woman grinding corn, this figure represents Chalchihuitlicue, Aztec goddess of water, whose name signifies "Our Lady of the Green Skirt." In the Aztec pantheon, Chalchihuitlicue ruled the rivers and lakes and was the counterpart of Tlaloc, the rain god, who governed growth and vegetation (see the "Unesco Courier", page 2, August-September 1973). This statuette of the goddess (40 cm. high) dates from the end of the 15th or early 16th century, when Aztec civilization was at its zenith. Its skirt may once have been incrusted with precious stones green in hue, a colour symbolizing for the Aztecs water and the rebirth of all things.

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SPECIAL NOTICE

This issue of the "Unesco Courier" and the previous issue (March 1975) have been published with considerable delay because of a strike at our Paris printers. We ask our readers' indulgence for these delays and the consequent late delivery of both issues.

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Cover

Years of disastrous drought in the Sahel, the vast semi-arid region bordering the southern Sahara, from Mauritania to the Sudan, have left destitute many of its nomad peoples. The fragile balance between man and his environment which enabled these nomadic herdsmen to subsist appears to have been destroyed, while economic and social changes introduced during the past few decades have created a situation that may be irreversible. This issue of the "Unesco Courier" examines the tragic plight and uncertain future of the peoples of the Sahel in the aftermath of drought and famine. Photo shows a Tuareg nomad family in search of a well.

Photo Raymond Depardon © Gamma, Paris

the drama of 6,000

kilometres of Africa's Sahel

by Howard Brabyn

"In less than 50 years' time... the advancing desert threatens to wipe three or four countries of Africa completely from the map."

Kurt Waldheim
United Nations
Secretary-General

(addressing the Inter-State Committee on Drought Control in the Sahel, in Ouagadougou, Upper Volta, on February 21, 1974)

LIKE the Tuareg who roam its northern expanses, the Sahel is a nomad, a shifting buffer zone between the wastes of the Sahara and the agricultural regions of the Sudan whose limits stretch and contract in accordance with the amount of rain that falls—or fails to fall—each year.

"Sahel" (from the Arabic word meaning "borderland") is therefore essentially a climatic term for an area vaster than India, almost 4 million square kilometres of semi-arid land stretching across Africa from Mauritania and Senegal in the west, through Mali, Upper Volta and Niger, to Chad and the borders of the Sudan.

In the area extending southwards from the southern fringes of the Sahara, nomadic herdsmen exploit the meagre resources of a belt of land in which annual average rainfall varies from 100 to 350 mm. Further south, in a region where rainfall varies from 350 to 600 mm., herdsmen and agriculturalists co-exist, the peasant farmer exchanging his grain for the nomad's animal products of meat and hides.

To understand what these rainfall figures mean it must be borne in mind that, in the Sahel, rain falls in short, concentrated spells and that 80 to 90 per cent of this moisture is lost through evaporation. In the world's temperate zones rainfall is not all that much higher (in Paris, for example, it is only 650 mm.) but it is more evenly spread out over the year and losses through evaporation are comparatively insignificant.

Relatively slight annual variations in rainfall can transform huge areas of land. Thus, in 1941-42, when rainfall over a 340,000-square-kilometre area of Mauritania dropped below 100 mm., the whole area (a third of the total area of the country) became inhospitable desert; ten years later, with rainfall once again above the 100 mm. mark, nomadic herdsmen were grazing their livestock on its pastures. Another swing of the pendulum and the situation is reversed. Over the past decade, for example, the Sahara has crept inexorably south, encroaching as much as 150 kilometres on what was formerly nomad grazing territory.

Against this shifting background the peoples of the region have built up a range of differing but interdependent life styles adapted specifically to both seasonal and cyclical patterns of moisture deficiency. In other words, semi-arid conditions are the one constant of the Sahel and it is upon this constant that the entire life style of the peoples of the Sahel is based.

But if this is so, why has the drought of recent years entailed such serious consequences? If the way of life evolved over centuries in the Sahel was specifically designed to cope with semi-arid conditions, why did it fail so catastrophically to stand up to what was, admittedly, a period of exceptionally severe drought?

The answer is that a number of technical and socio-economic innovations, introduced from the outside, upset the precarious equilibrium of the area. These innovations were introduced with the best of intentions. What could be of greater practical help to the herdsman in a drought-prone region than the digging of deep wells and the creation of a chain of watering points for his cattle? What could be more logical than to control or eliminate the periodic and endemic diseases that regularly decimated his herds?

These innovations did not only affect the herdsman. To help the peasant farmer, cash crops such as cotton, ground-nuts and rice were introduced. Population grew and more and more former grazing land was put under cultivation.

With disease largely eliminated, the nomad's herds multiplied and more and more cattle were concentrated on diminishing areas of grazing land. Gathering round the newly-created watering points the enlarged herds soon degraded the fragile pasture. Thus, in solving the problems of animal health and watering, a new problem was created as drought became more acute, that of hunger. During the recent five-year drought period, over a third of the total cattle stock died of hunger rather than of thirst or disease.

Would it, then, have been better not to interfere, to allow disease and thirst to regulate the size of the nomad's herds? In countries that need to make use of every available resource such a wholly negative policy would have been unforgivably wasteful. Indeed, the policies that were adopted cannot, in themselves, be faulted; what went wrong was that those who introduced them failed to take into account the social, economic and ecological consequences of their successful implementation.

Traditionally the nomad felt obliged to maintain the largest possible number of cattle in order to guard against the ravages of disease, drought and marauding rivals. Watering points were fewer, but their use was controlled by a mixture of force, agreement and custom. When disease was controlled and watering problems reduced, the nomad continued to maintain large herds as an insurance against

CONTINUED PAGE 7

Photo © Claude Sauvageot, Paris

HOWARD BRABYN, *English writer and journalist who has specialized in popularizing scientific and educational questions, is editor of Unesco's quarterly "Nature and Resources" (annual subscription 20 F). He was previously assistant editor of the English edition of the "Unesco Courier".*

Photo Alain Noguès © Sygma, Paris

Photos on this page depict the ordeal of the nomad peoples of the drought-stricken African Sahel. Above, women and children scratch in the sand for remnants of grains and husks left behind after an air drop. Air-borne food supplies and other aid were not able to provide for the needs of all the inhabitants of the belt of drought that stretched 6,000 km across Africa, in 1973 and 1974.

Thousands of Tuareg herdsmen fled the Sahel to escape famine, some of them crossing the Sahara in an attempt to reach southern Algeria. Relief programmes were launched by the Algerian government and the Red Crescent (the Red Cross of Muslim countries), but exhaustion and sickness have taken a terrible toll. Below, survivors of the exodus at Tim Gaouine, Algeria, in 1974.

Photo Raymond Depardon © Gamma, Paris

disasters which had become much less of a threat.

Subsequent events have taught us that if the improvement of watering arrangements had been coupled with controlled use of the new watering points and the reduction of animal disease had been coupled with pasture improvement schemes and better marketing arrangements to handle the increased animal production, the scale of the recent disaster would have been greatly reduced.

The destruction of the basic pastoral forage and fodder resources through over-exploitation, serious enough before the recent drought period, had catastrophic consequences during years in which rainfall was significantly below average. The central problem of the Sahel is, therefore, one of the management of grazing lands under marginal and fluctuating climatic conditions *in a particular social, economic and cultural context*. It is a problem which cannot be solved by taking separate action on one, two or even half a dozen individual difficulties; what is needed is an overall approach to the system as a whole.

This is where Unesco's Man and the Biosphere (MAB) Programme, with its integrated, interdisciplinary approach to research aimed at improving man's partnership with and management of the environment, has a vital part to play. One of its main objectives is precisely to examine the impact of changes in human populations, settlement patterns and technology on the ecosystems in which they occur.

Research undertaken by MAB is not limited to the study of grazing lands and arid and semi-arid zones such as the Sahel; it covers all the major ecological systems of the world including both tropical and temperate forests, lakes, marshes, rivers, deltas, estuaries and coastal zones, mountain and tundra lands and island ecosystems.

However, the problems of the Sahel have a particular urgency and Unesco is fortunate enough to have a wealth of experience and research material at its disposal thanks to its earlier Arid Zone Research Programme. This Programme, which ended in 1962, provided the basic knowledge about the natural resources of Africa, its water resources, the problem of nomadism and various aspects of the development of arid zones and the utilization of land and water on which all current research is based. It gave rise to the publication of the World Soil Map, a vegetation map covering the whole of Africa and the preparation of a map of groundwater resources in Africa north of the Equator.

Where the MAB research programme differs from what has gone before is that it brings Man back into the forefront of scientific research. At a MAB regional meeting held in Niamey, Niger, in March 1974, after listing a number of reasons for the comparative failure of previous development schemes for the Sahel, MAB experts concluded:

"Perhaps most important, however, is the fact that insufficient attention and importance has been given to the socio-economic and ethno-cultural context of local populations. These populations have an intimate knowledge of the environment and a wealth of experience which we have not always fully appreciated or used. Given the need in any successful development action for active participation of local populations (thus excluding the imposition of ill-adapted exterior models) and given the disorganization of the pastoral system after a period of drought, it is recommended that:

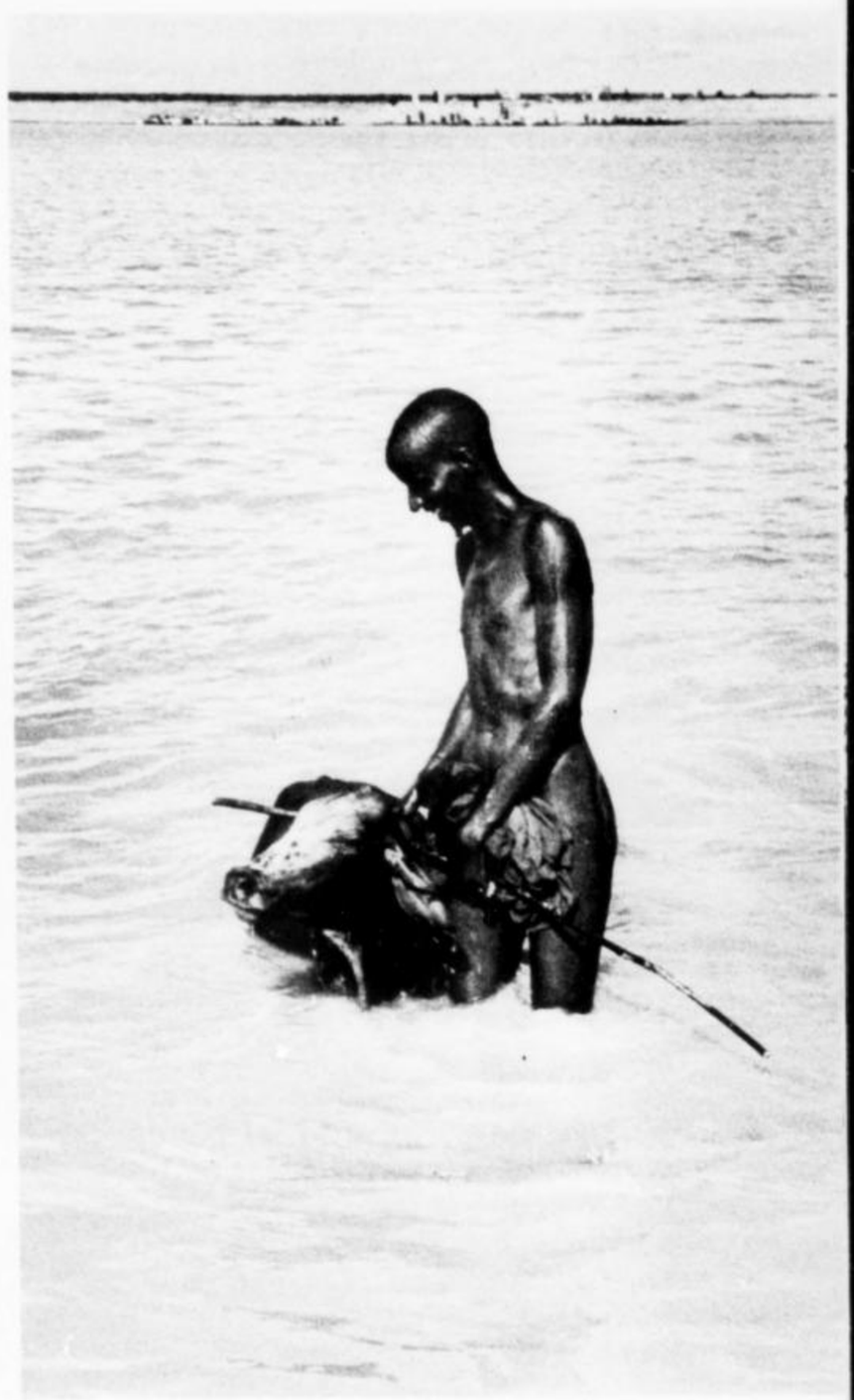
- all research and development operations take into account the social and economic context of local populations;
- the experience and knowledge of local populations on cattle-breeding and on the local environment be considered the point of departure for studies which precede development projects;
- all research and development actions be accompanied by educational action so that local populations recognize their responsibilities in the use and exploitation of their environment;
- in the context of the recent drought, a detailed evaluation of the carrying capacity of the Sahelian zone be undertaken, as well as an examination of the behaviour of local populations during the period prior to the present situation."

Pilot research projects now being planned will be concerned primarily with two typically Sahelian human and ecological situations.

The first of these concerns the zones of contact between grazing lands and cultivated lands. In these contact zones the main purpose of the pilot studies will be to help develop land management guidelines based on mutually beneficial social and economic relationships between nomads and peasant farmers.

The second area for research concerns regions where rainfall is insufficient to support agriculture and the main land use is, and is likely to remain, livestock breeding on a nomadic pattern. The aim of pilot projects in these areas will be to assess the carrying capacity of the land and to provide guidelines for its management. They will also examine the possibility and consequences of a fundamental reorganization of life in rural areas such as a change from nomadic to sedentary cattle-raising.

As an example of what could be done, Gabriel Boudet, a French expert in grazing land management and a MAB consultant, has proposed an outline land management scheme which would involve a change from migra-



Photos © Claude Sauvageot, Paris

River of life in a thirsty land

Top photo, a Peul herdsman happily waters his cow in the mighty Niger river. But away from the river, water is scarce and must often be sought by digging holes in dried-up river beds. Above, a Niger girl ladles precious drops into bowls and pitchers.

tory to sedentary cattle-farming (1). The scheme would be applicable in areas where conditions were favourable for fodder production and water supplies were adequate. It assumes, of course, a careful preliminary study of the carrying capacity of the area concerned and would involve some 7,000 head of cattle representing the combined herds of 70 families or a total of about 350 individuals. The scheme is presented diagrammatically on opposite page.

The area to be managed would centre on a deep well which would provide a source of water during the dry season. A village to house the herdsmen's families would be situated some 500 metres from the well. The dry season pasture would consist of an area of some 31,500 hectares forming a circle of land with a 10 kilometre radius around the well.

Outside the circumference of this circle would be a ring of land, some three kilometres wide, which would serve as grazing land for the rainy season. Spaced out at regular intervals in this area would be a series of 10 "guzzlers", or artificial ponds, capable of holding sufficient water between major spells of rain to provide for the needs of 700 head of cattle (one tenth of the total herd) for about 15 days. Round each "guzzler" would be an 840-hectare grazing area.

In the dry season each herding unit of 700 cattle would be brought inside the "dry season circle" but would remain towards the outer edge of the circle. Each day the cattle would go to be watered at the central well, being driven along narrow well-defined paths in order to avoid trampling the pasture land. Later, the herds would move again to within five kilometres of the well, thus reducing the distance to be covered to obtain water during the period of greatest heat.

Simple as the scheme may sound it would require enlisting the wholehearted co-operation of the herdsmen and an educational programme to explain the need to adopt new habits and disciplined control of herds.

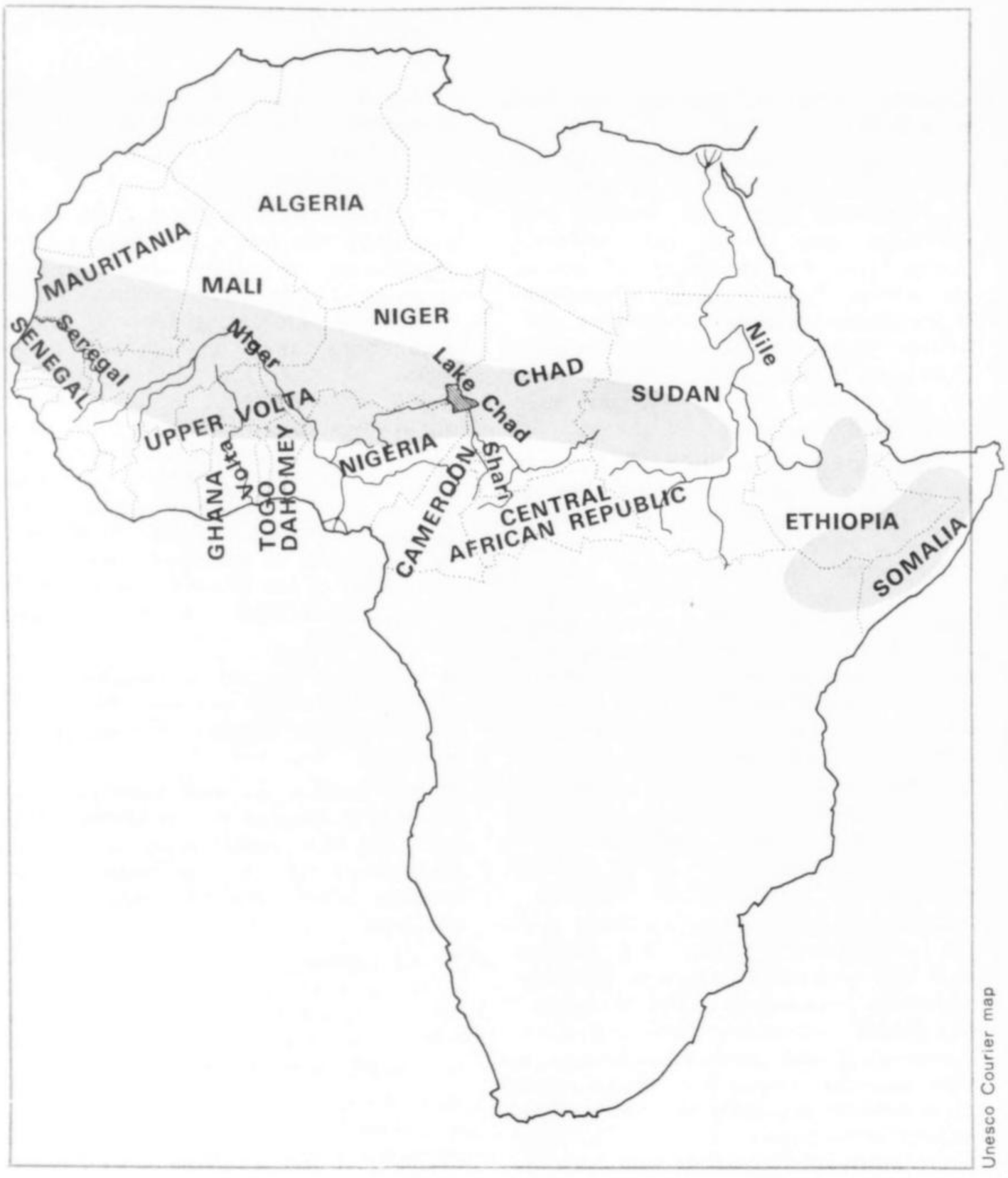
One of the major preoccupations of MAB in its research on the problems of a specific area is to acquire a body of knowledge and experience that can be applied to similar problems arising elsewhere. In recent years drought attaining disaster proportions has also struck Ethiopia and parts of Somalia and the Sudan. While not strictly a part of the Sahel, these areas have very many similarities with it and are often referred to as forming part of a wider entity of semi-arid land called the Sahelian Zone. The knowledge being acquired by MAB in the Sahel proper will soon, therefore, be aiding the drought-affected nomads and peasant-farmers of these regions.

Throughout Unesco's Man and the Biosphere Programme runs the theme of man as a social being and his relationship with his environment. Nowhere can the importance of this kind of approach be greater than it is in an ecosystem as fragile as that of the Sahel. Every action to be taken must be weighed and examined from every angle, scientific, sociological, economic, cultural, etc. The recent disaster in the Sahel provided a costly reminder of the dangers of taking short cuts.

The ecologist, that general practitioner of science, knows that whatever he does to the smallest fraction of that living microcosm he calls an ecosystem will have its effect on the whole organism. He must be able, as William Blake wrote in another context,

To see a World in a grain of sand
And Heaven in a wild flower,
Hold Infinity in the palm of the hand
And Eternity in an hour. ■

(1) In "The Sahel: Ecological Approaches to Land Use", to be published by the Unesco Press, Paris. Price 16 F.



Unesco Courier map

THE SAHEL. Spanning the breadth of Africa, the region known as the Sahel (outlined in grey on map) is more than 30 times the size of England. The two grey patches at right of map indicate areas of Ethiopia and Somalia forming part of the Sahelian zone and also hit by the drought, in 1973 and 1974. Countries named on map are those directly or indirectly affected by the Sahel catastrophe. Opposite page, a mother and child lying exhausted on the sand—an image of the human misery inflicted by the worst drought experienced in the Sahel during this century.

SATELLITE'S EYE VIEW OF DESERT RANCH

In a study on the Sahel carried out for Unesco's "Man and the Biosphere" programme, an American specialist, Norman MacLeod, stresses the value of remote-sensing techniques in drawing up a map of natural resources, carrying out surface water studies, and analyzing cropping patterns, etc. Dark-coloured polygon on photo right, taken by earth-girdling satellite on May 8, 1973, is formed by vegetation contrasting with the surrounding desert. It marks the boundaries of the "Toukounouss" ranch, established in Niger several decades ago. To maintain this greenery in the midst of an arid landscape, the ranch owner divides his land into five grazing areas, only allowing his cattle to graze on a single area each year. This "rotation" gives the grass a chance to grow in the other four areas. Wire fence surrounds the ranch.

Photo David Burnett © Gamma, Paris

PASTURE ROTATION. A Unesco study has proposed a scheme of pasture rotation for the Sahel, involving a change from migratory to sedentary cattle farming, so as to reduce the dangers of catastrophic drought (see diagram below). A circle of land 20 km in diameter would centre on a well providing water during the dry season for some 7,000 head of cattle. Herdsmen's families would live in a village near the well, on which cattle tracks would converge. Outside this circle a ring of land (represented by 10 small circles) would provide grazing during the rainy season. At the centre of each grazing area is an artificial pond fed by rainwater.

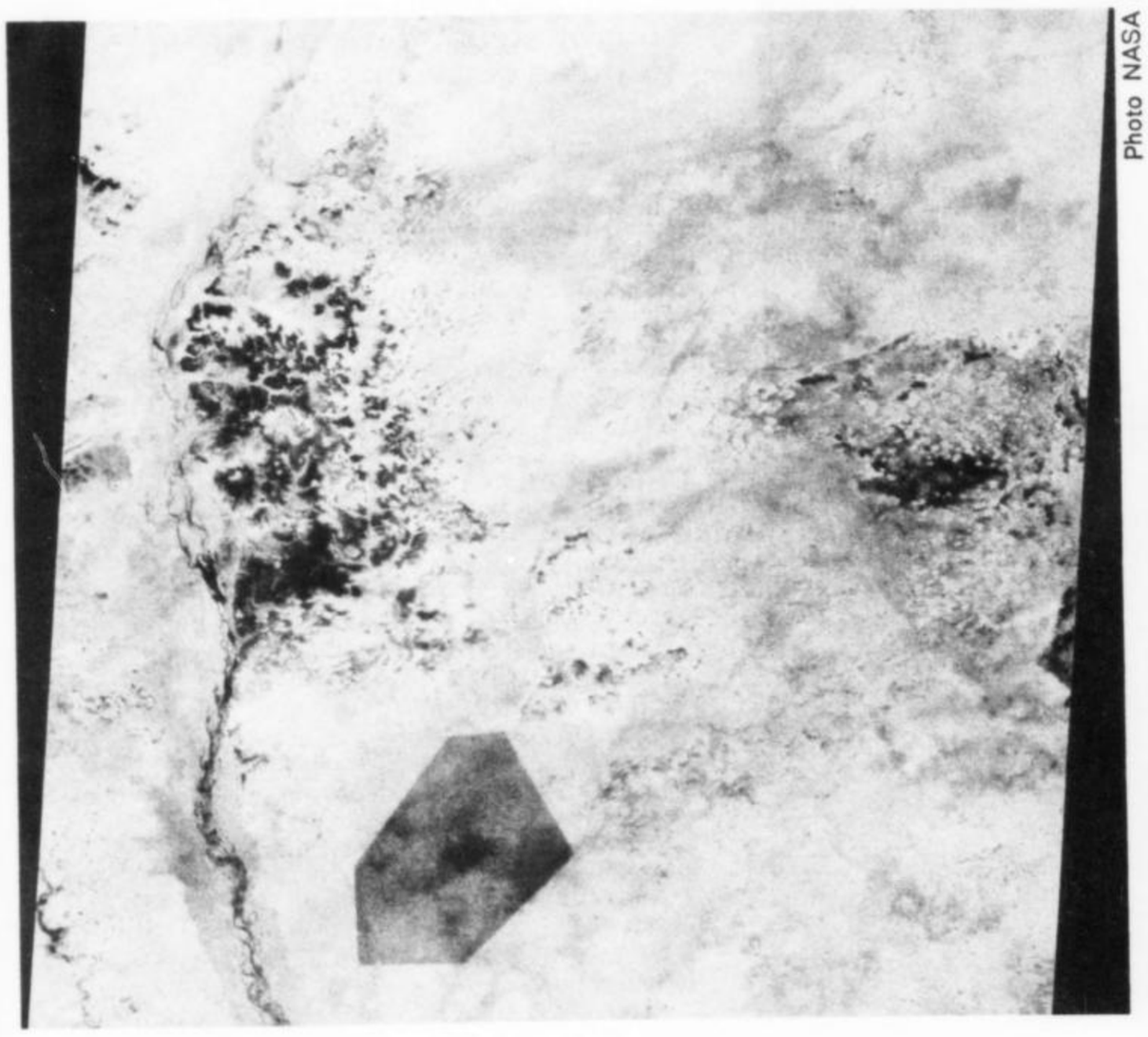
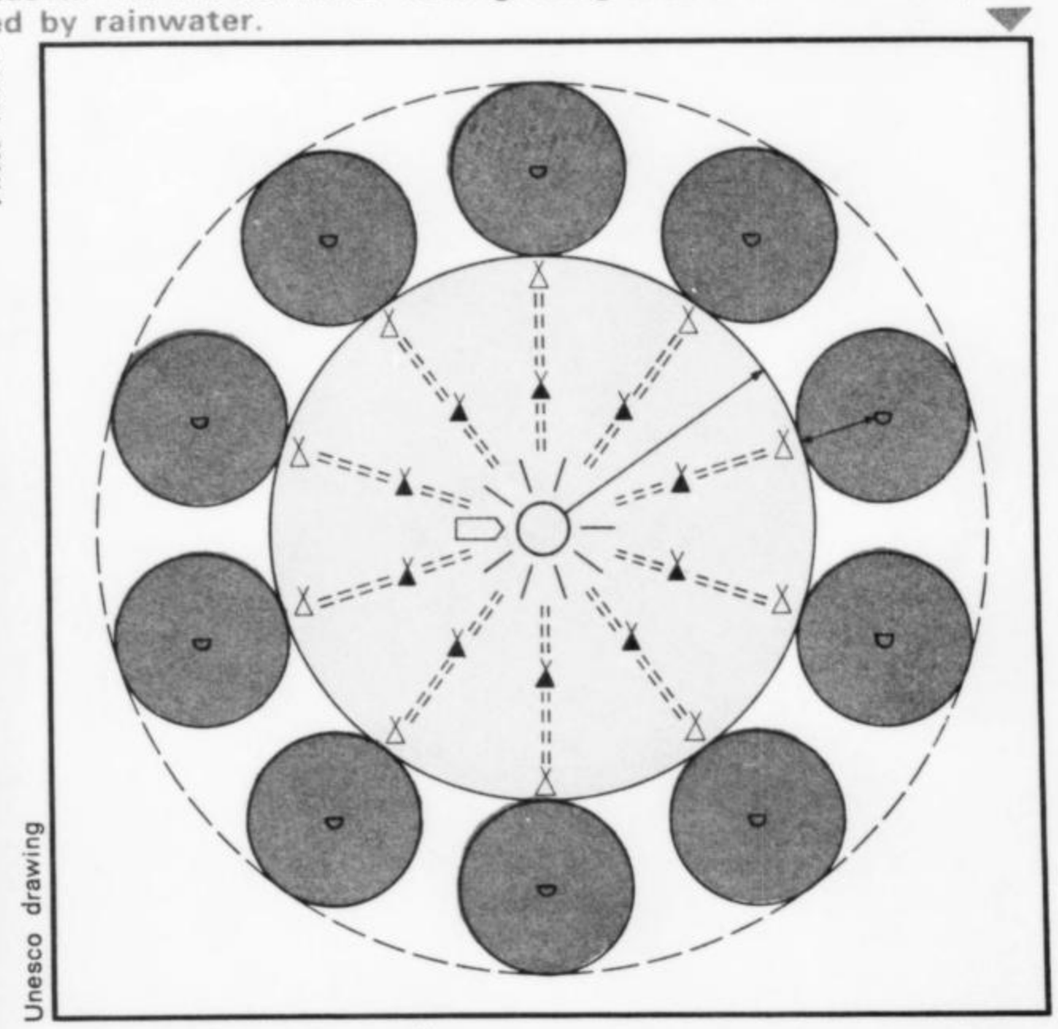


Photo NASA



Unesco drawing

Artificial pond
Well
Permanent village
Encampment - start of dry season
Encampment - end of dry season
Cattle track

sahel

By Jacques Bugnicourt and an international research team *

Photo Raymond Depardon © Gamma, Paris

The texts published on the following pages are taken from an important study on the African Sahel carried out in Niger as part of a programme called " Formation pour l'Environnement " (Training for the environment) which concerns Africa as a whole. The programme was launched jointly by the African Institute for Economic Development and Planning (set up in Dakar, Senegal, by the United Nations and African countries), the United Nations Environment Programme and the Swedish International Development Agency. The study on the Sahel, entitled *Un Peuple privé de son Environnement* (A people deprived of its environment) was carried out by Professor Jacques Bugnicourt of the African Institute for Economic Development and Planning (Dakar). It is based on contributions from an international team drawn from 12 countries of Africa, Europe and America (*). The study deals primarily with the peoples of the Sahel from the area of the Niger Bend who, driven by drought and famine from their traditional nomad trails, found refuge in a relief camp near Niamey, capital of Niger. What is to become of these nomads, uprooted from their homeland and deprived of the natural environment in which they have lived for centuries? Can an exceptional drought suddenly threaten the very existence of their traditional way of life? By interviewing the refugees from the Sahel, Prof. Bugnicourt and his team have sought some tentative answers to these questions.

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1. nomadsland or nomansland?

THE Sahel is green again, but along the trails where the cattle of the Tuareg and Peul died, the grass still grows thinly. Drought and famine, aggravating the consequences of a number of economic innovations and policies, have left the inhabitants of this arid zone without the essential means of coming to terms with their environment—their camels and their cattle—and forced them into exile from their homelands.

They are now a people deprived of its environment. (*)

How did this happen? What can be done for these people? What future is there for them? The best place to look for an answer to these questions is among the refugees who fled from disaster. The facts related in the following texts are based on an inquiry carried out at the Lazaret camp, 6 km. from Niamey, capital of Niger, in which 13,000 nomads, nine-tenths of them Tuareg or Arabs, were crowded together in March 1974.

Our primary concern was the fate of the nomads, mostly from the Niger Bend area, who had been swept in the course of the exodus towards townships in Niger and in particular to the Lazaret camp. Our particular interest was concentrated on a people's natural environment and what happens to them when they have been driven out of that environment.

Recent history has made the Sahel a threatened area. Previously, hard though his life was, man lived here in a kind of symbiosis with his harsh environment; that symbiosis is now in peril, to such an extent that it is no longer sure whether there is any place for man in it.

North of the 15th parallel, ecological conditions deteriorated during 1972-1973 to such an extent that hardly any livestock survived and agricultural production was non-existent. Famine drove out the population.

Between the 15th and 13th parallels, surface water disappeared with the result that cash crops could no longer be cultivated and grazing was no longer available, thus depriving the farmer of his sources of both food and money.

Between the 13th and 12th parallels, on the other hand, although rainfall was low it was still sufficient to ensure a minimum level of production of certain basic crops, mainly food crops, and to maintain the pastureland.

South of the 12th parallel, where the crops are more diversified and the rainfall less scanty, there is reason to believe that the effects of the drought on farming were less tragic and that the results will not be so lasting.

Thus, in the space of about 250 km., going from south to north, the situation changed from a relatively comfortable one to one of total destitution.

By the end of 1972, it was clear that throughout the northern Sahel, the herdsmen living beyond the 13th parallel had little choice but to move out or to die.

In Niger, "During the last months of 1972, the situation reached danger level for the nomad and sedentary populations of the northernmost regions, the first to be affected, whose natural adaptability was already stretched to the limit. There was nothing more to be done. They began to drift slowly down towards the south, towards the towns." (1)

The situation continued to deteriorate during the following months.

In the autumn of 1973, famine struck many of the groups living in the Sahel in all its force. Near Zinder, a herdsman is reported to have thrown his wife and their two children down a well so as not to have to watch them die before his eyes. In the abandoned hamlet of Hakkam, 60 km. or so to the north of Dakoro, "medical orderlies found the desiccated body of an old man in rags, who appeared to have died of hunger and thirst because the whole population of the village had left without his knowing." (2)

"The way things are now, a father even has to forget his own child", said the head of one family group from Agadès.

These nomads who have been forced into exile have been used to an extremely hard life, even at the best of times. But until famine struck they had managed to survive, scraping a bare living from their environment.

What has happened is that the environment has been destroyed, the vegetation and water have disappeared, flocks and herds have perished and many human beings along with them. The nomads fled from this inferno into the unknown.

So began a pitiful exodus. Food distribution centres were set up for those who were strong enough to drag themselves that far, and the refugees settled into an environment totally different from the one to which they were accustomed.

Successive waves of Tuareg, Arabs, Peul, Wodaabe, Songhai, Zerma and Hausa trekked down towards the southern Sahel, some of them into Upper Volta, Dahomey or even the Ivory Coast, many others in the direction of Nigeria.

These migrations were by no means a uniform, constant movement. On the contrary. The exodus of the Wodaabe and Peul seems, for instance, to have been quite different in character from that of the Tuareg.

In the area stretching from the banks of the Niger opposite Dahomey as far as Mali, it is reported that the Peul, "alert to and observing the warning signs of famine, began to move towards the south with their herds much sooner than the Tuareg. They reduced their herds of their own accord by selling off animals cheaply, which enabled them to stave off disaster.

"The Bororo Peul, of the Tahoua and Dakoro regions, had already found an original solution to the problem of ready cash four years previously, by sending numerous groups of women to Ghana and the Ivory Coast to sell magic recipes.

"Some of the young men went with them in 1972 and considerably more in 1973. In 1974, husbands and wives, leaving the children in the care of the elderly, left together. Many Peul families... managed to keep a few head of cattle. This enabled them to survive (a Peul family of four can subsist for a year with a single cow) and to preserve, with their animals, the familiar pattern of their existence, their familiar surroundings and to some extent their eating habits. " (1)

Many of the groups split up, hoping to improve their chances of survival by going in different directions: the Tuareg towards Niger and Algeria while others went elsewhere.

Once the nomads had decided to go beyond their normal grazing territory, a decisive step had been taken, but that step did not necessarily lead in the direction of Niamey.

None of them had fixed on an ultimate destination. One route was chosen in preference to another simply "because there was grazing". Families set off without knowing whether they would be coming back again: "We all wanted to feed our families... we did not set out with the intention of going to Niamey but simply to find grazing and water". "We left because we wanted to find grazing. When the drought hit us and our animals died, we kept moving, looking for food for ourselves."

(*) See also "Environment in Africa" (environment and regional planning research bulletin) published quarterly in Eng. and French editions. B.P. 3370, Dakar (Senegal).

(1) Yveline Poncet. "La Sécheresse en Afrique sahélienne, une étude microrégional en République du Niger; la région des Dallols." (Drought in the African Sahel, a micro-regional study in the Republic of Niger ; the Dallols region). O.E.C.D., Paris, March 1974. 51 pp.

(2) Georges Arnoux (Circular letter), Catholic Mission, Niamey, September 9, 1973.

Some families did head straight for Niamey: "Because it is a town where we had heard that we might be able to find food." But this was true of only one family in four, the other three families setting out aimlessly, not knowing whether they would end up in Niamey or elsewhere.

Uncertainty as to where they were going explains the often complicated route they followed. There were many changes of mind and changes of plan: some members of one group coming from Kidal, for example, decided to turn around and go back, taking with them four camels, five cows, seven goats, three donkeys and three sheep.

As long as a few of their livestock were still alive, the herdsmen kept on searching for stubble that had not completely dried up or for areas where bushes had not been utterly devastated.

Some continued on foot after their animals had died. Others took any means of transport available, including boats. "From Mangené we were taken in vehicles towards Niamey, and we sold everything—tents, mats, silver earrings, bracelets—to pay for this transport."

Not surprisingly, the time taken on the journey varied considerably from one group to another, since none of them knew too well where they were going or by what route. It is certain, however, that most of the groups covered more than 500 km.

The southward-moving nomads no longer had anything much to offer the villagers, with whom they quarrelled over the often scarce water and the scant pasturage. To begin with they had animals to sell, but the villagers' herds had also been hard hit and they were short of money. Later the Tuareg and Maures bartered or sold off their tents, jewels and other objects which they had taken with them.

Finally, the migrants, weak as they were, had nothing to offer but their labour. They attempted to win the acceptance of the local population by doing odd jobs for them, fetching water, grinding millet or gathering and selling brushwood.

Relations between the nomad herdsmen and the villagers varied, however, during the various stages of this exodus and in some places the nomads met with hostility. "Sometimes we had to wait until nightfall so that we could fetch water without being seen." "Wherever we went the villagers would give us food and drink, but when we had animals the villagers would refuse to let them have any water unless we paid for it."

Such attitudes, however, by no means reflect the experience of the majority of the nomads in the course of their migration. "They used to give us water to drink. As to food, the time came when there were so many people that the villagers could no longer give us anything to eat." ... "When some of our people died and we had no money left, they gave us cloth to make shrouds for the dead."

Generally speaking, the villagers were considered to have been hospitable enough—something which cannot be over-emphasized. Two out of three families considered that they had been well received.

Such animals as the nomads still possessed when they resigned themselves to the idea of leaving were almost all sold for next to nothing or killed off by hunger or thirst somewhere along the trail towards the south of the Sahel.

It was a sore trial for Tuareg, Maures or Peul who managed to take a few animals with them to discover that their herds, of which they had been so proud and which they had spent their lives building up, were no longer worth anything much. In the regions to which they had now come, crops had been poor, so more and more cattle were for sale and less millet was available.

They would sell off their oldest animals first, then their sterile cows, then the bulls, and lastly cows in calf "for a few kilos of the farmer's grain". But selling off animals for grain—or even in exchange for the right to water the rest of the herd—was not the main reason why the number of livestock dwindled.

"We lost a camel and a donkey on the way", said a chief from Agadès, "and we sold two camels and three donkeys", but for the most part the livestock perished during the journey. Some idea of the losses suffered by the flocks and herds can be gleaned by reconstructing the story of the families who took refuge at the Lazaret camp: a group of families, who at the time of leaving numbered slightly less than 700, lost in the course of their exodus to the south some 3,500 animals, including 330 camels, 690 cows, 1,300 sheep and 900 goats.

One can well imagine how painful it must have been for people for whom cattle-raising had been their whole way of life to watch the slow death of their beasts before and during the exodus. It is almost impossible to imagine or to describe, however, the miseries of the long march towards the towns further south.

Famine soon struck. Families were reduced to eating berries and seeds. A few of the animals were killed. Young children were sent to try and beg food in the villages.

"If we were near a village and we heard the sound of grain being ground, we sent the children to beg for the bran left behind after the grinding. The children would eat it on the spot but had difficulty in digesting it. If any was left, they would bring it back to us."

Here is the story of a family from Bourem: "After we had lost our cattle, we kept on walking for two months. A seven-year-old boy called Issa, a girl of the same age called Raissetou and a twelve-year-old boy died at Watagouna, near Ansongo." All three died of hunger. How many other families have similar stories to tell?

It was thus not only the animals which died off one after the other. The way to the south is marked by the graves of the Tuareg or Maures who did not have the strength to continue as far as the relief centres. They died either from hunger and fatigue or from some illness which, in their weakened state, made short work of them.

Some members of the Kelahara group from Menaka buried a third of their number in the course of their wanderings. A Gao family tells the following story: "There were eighteen of us to start with: six died on the way... they were children who were used to drinking milk, but while we were travelling they had nothing to eat but millet bran and they suffered from stomach aches which finished them off."

Hama, aged 41, from Timbuktu, is the head of a family of 13 of which he and five others have survived—a woman of 25 and four children aged from six to ten. "We set off on foot to escape from the disaster-stricken area in March 1973. Two months later, our little group was completely exhausted. Two boys—Momar and Mohamed—died, followed by five girls—Mariama, Asmao, Aminatou, Aisha and another Mariama."

The head of one family told the following story: "The camels became too weak to carry us. We went on on foot. Our old father was lagging behind and slowing us up. Finally he sat down in the sand and told us he would catch us up later. That same night, my younger brother could stand it no longer and turned back to look for him. We have not seen my brother since. He must have got lost as well."

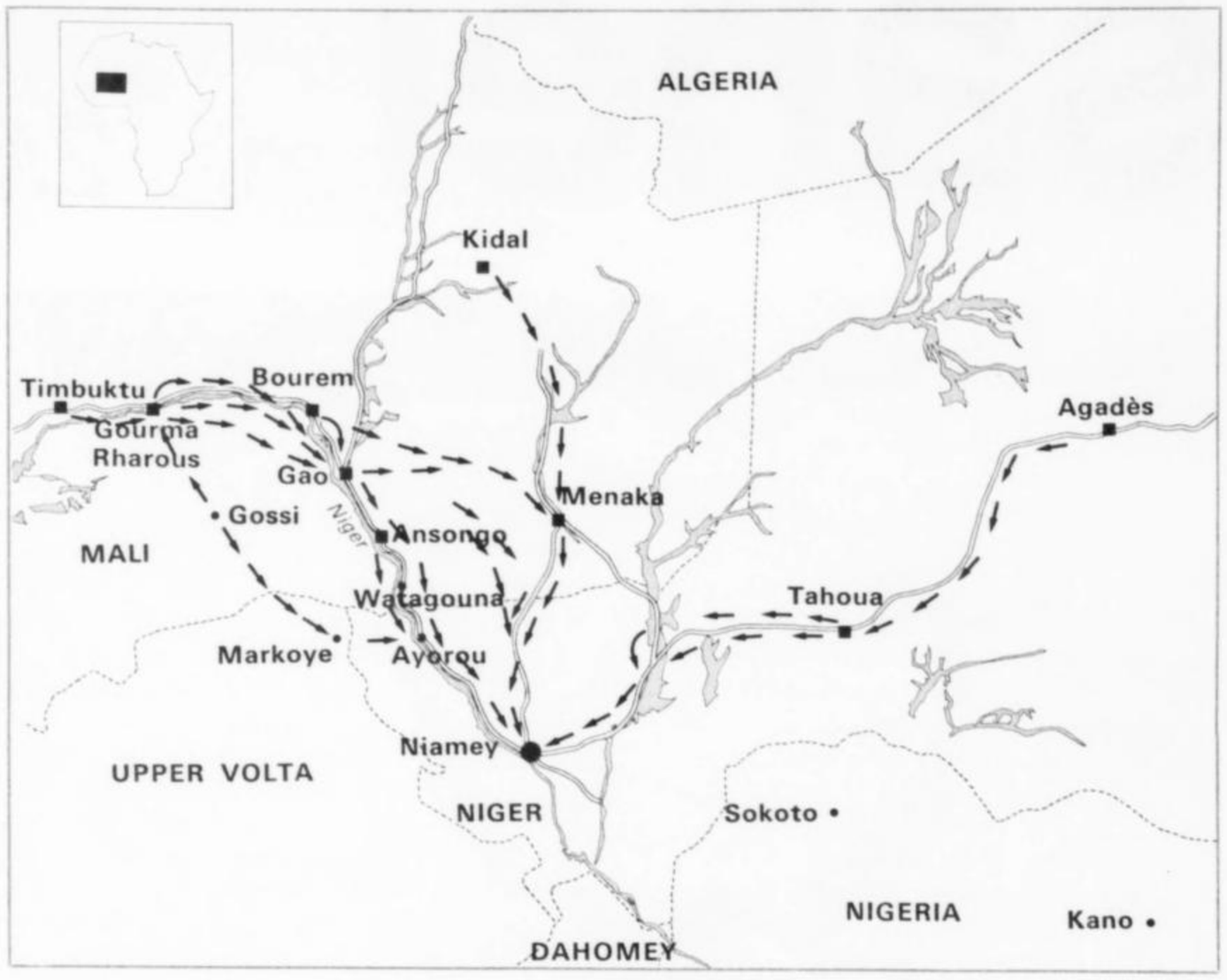
Some families, it is true, survived, but wherever they came from, all the groups suffered considerable losses. Our inquiry suggests that the nomads who ended up at the Lazaret camp lost at least a sixth of their number on the way.

How many died in all? We shall never know, since some groups and families disappeared without trace... The nomads in the camp often do not know how many of their group were left behind.

In many cases more people remained behind than left. Often, too, those who stayed had no means of subsistence, and their chances of finding enough food and water to survive were very slender.

The situation of many of these people was summed up by Tuareg refugees from Gao: "We have no way of getting back to those who were left behind, and they have no means of coming here, nor of surviving back there where there is now no livestock".

The refugees will continue to be haunted by the thought of those they left behind.



Map, Unesco Courier - Jacques Bugnicourt, Dakar

FLIGHT FROM DROUGHT AND FAMINE. Arrows on map above show the main routes taken by the nomads of the Sahel in their exodus towards Niamey, capital of Niger. Between Timbuktu (Mali) and Agadès (Niger) they usually followed the course of the Niger river or trekked along dried-up river beds. Fleeing from drought and famine, decimated by thirst, sickness and exhaustion, they came in waves towards southern Niger. Black rectangle on the outline of Africa reproduced on the map indicates area over which the exodus took place. Below, a group of survivors at the Lazaret refugee camp near Niamey. Most of those who reached it had covered hundreds of kilometres.

Photo David Burnett © Gamma, Paris

sahel

2. the battle for

Photo Philippe Ledru © Gamma, Paris

An ox or a cow needs to drink at least 30 litres of water daily. Deprived of this amount it is soon reduced to the condition of the emaciated cow seen at left. On right, sturdy cattle slake their thirst at a new borehole in the desert. Many Sahel wells have dried up, and where water was once found at a depth of 12 metres, the nomads must now dig down as much as 36 metres to reach it.

UNCERTAINTY and danger are the very essence of life in the Sahel. Its immense open spaces are sometimes a hostile desert shunned by man and, at others, green pastures towards which the herdsmen drive their animals.

Although the amount of rainfall in the Sahel is the most immediately striking factor, the timing of the rains over the year is also important.

Other influential factors are: the different types of soil, some of which retain water better than others, so that fertility varies as also do the dangers of erosion; the subsoil, which may or may not contain reserves of water that can be tapped by the nomad shepherds either directly or indirectly by means of deep boreholes; and lastly the vegetation cover on which the life of the animals and the herdsmen ultimately depends.

The fact that there is grass does not necessarily mean much in itself. Grazing land is only of any value if there is accessible water nearby. To water a flock of a hundred head during the dry season, the shepherds must draw more than 3,500 litres of water a day from a depth of 30 to 50 metres.

The problems of providing the Sahel with wells have long been recognized as crucial, especially during that part of the year when the pools are dried up and the animals get hardly any moisture from the vegetation they consume.

Sometimes parched, sometimes verdant, the great expanses of the Sahel have a vegetation that varies not only from year to year but also between different seasons of the same year. In the steppes of the northern Sahel, every tuft of vegetation has to compete for moisture with its neighbours.

The wadis and watercourses provide favourable ecological conditions. In their dried-up beds and on their banks grow plants and small trees, or bushes whose leaves provide fodder which the animals relish. However, these favourable conditions are rare in the north of the Sahel, most of which consists of pasture land covered with tall, drought-resistant grass.

The southern Sahel begins where

survival of the Tuareg and their herds

the grass at times forms a continuous carpet of green, where trees and bushes begin to dot the landscape and where the alternation of the seasons can be more clearly perceived.

There also exist a number of "refuge" areas in the immediate proximity of aquifers, streams or rivers, such as the central Niger delta, and the water courses, often temporary, which converge towards it.

What must be borne in mind is the extreme variability of the grass cover in space and in time. In an average year, the vegetation of the Sahel produces a heavy but short-lived crop.

What animals can live off this vegetation? A camel will eat whatever it finds, including thorns. Goats, of course, are still less hard to please and will even eat plants which are toxic to other animals.

In the Sahel, goats in fact play an ambiguous role: they have, it is true, a catastrophic effect on the poor vegetation, but on the other hand they are the only animals capable of finding nourishment in certain vegetation zones, such as on strips of rocky ground. Cattle, though more choosy, find food on the various types of grazing land in the Sahel, while sheep will eat the grass left over by the cows.

Traditionally, the nomads stay near to ponds during the wet season. When these dry out, they lead their flocks and herds towards areas where the aquifers lie at a depth of no more than 10 metres. In the middle of the dry season, they move towards the banks of the river or of permanent branch channels.

The size of the flocks and herds which the different types of grazing in the Sahel can support certainly varies from year to year and from month to month. The quantity of grass produced in one and the same area may be anything between 600 kg and 5.2 tons to the hectare, and sometimes the cattle leave untouched as much as a third of the grass available for consumption.

With a rainfall of 300 mm., the number of hectares required to support one head of cattle ranges from 6 to 30. Within these ecological constraints, it is up to the herdsman to decide whether to increase his herd or to keep it at the same level.

The herdsmen have themselves been strongly marked by the environment in which they live as regards their patterns of behaviour and their way of life.

Conversely, they have to some extent transformed that environment by drilling wells, marking out trails, and leading their herds from one grazing ground to another, thus modifying the grass and bush cover of the ecosystem.

While nomadism as practised in the north follows no regular pattern, transhumance, or the passage from summer to winter pastures and vice-versa, is an annual cycle which allows the vegetation resources to be used to the maximum.

The logic of the nomadic system of stock-rearing and, in the more southerly regions, of the regular seasonal movement of herds has been dictated by the basic characteristics of the Sahel. The herd followed the vegetation, the Tuareg or the Maure followed the herd and the servant tended to his master's needs and watered the cattle.

But this does not mean that no sort of control was exercised. One of the main reasons for the power of the herdsmen was their skill in managing the Sahel environment. Wars, conflicts and fights were frequent, but there was nevertheless a certain consensus among the Tuareg concerning the distribution and rational use of the grazing grounds and watering points.

Relations between the nomads and the villagers were also more or less

Herdsmen's ties of friendship

The Wodaabe—one group of the Peul people—practise a traditional form of aid known as "haBBanaae" (as it is written in Pular, the Peul language). It is a kind of contract or bond between a cattle-owner (the "kaBBanDo", or "he who attaches") and another person (the "kaBBanaaDo", or "he who is attached"), who wishes to build up a herd. The "kaBBanDo", a man of substance, lends the "kaBBanaaDo" one or several cows to start off a new herd or to increase an existing one.
The "kaBBanaaDo", usually a young bachelor or a poor man, rears the animals on loan to him, keeping the milk and butter they provide and also the first three calves born to each cow. When an "attached" cow has calved for a third time, it is returned to its owner and the contract ends.
The "haBBanaae" contract is the special form of aid for the needy provided for by Wodaabe custom. The cows on loan are called "animals of friendship", representing not only the nucleus of a new herd, but also symbolizing the ties of friendship between a poor man and a person who wishes to help him. A Wodaabe proverb maintains that an "attached" cow must always be at the head of the herd: it is always the first to be watered, it should be caressed and never beaten. In the evening the herdsman must personally take it to the pen. This love for an "attached" animal is often held up as an example, and it is said that one person loves another as much as he loves the animal "attached" to him. It is in these terms too that a boy will express his feelings to the girl he loves.

Photo FAO, Rome

codified by custom. Only in areas with year-round humidity or, further south, where the rainfall becomes increasingly abundant, was agriculture practised and millet grown to be exchanged for meat and dairy products. There is therefore nothing here to disturb the Sahelian environment too seriously.

It would, however, be unwise to regard the period of Sahelian history preceding the colonial conquest or that which immediately followed it as having been relatively idyllic. The "equilibrium" which some people claim then existed was achieved only at the price of epidemics which ravaged the cattle and of increasingly severe famines.

In the Niger part of the Sahel, for instance, memories subsist from before the colonial period of the "Ize nere" (the sale of children) famine when "useless mouths" were exchanged for food; of the "Gaasi borgo" when the people had nothing left to grind in their mortars but gourds; of the "Yollo morou"—"stroke your mats" (because there was nothing else to do). (1)

Famines did not end with the arrival of the French: 1913 saw the great "beri" ("chest") famine which ravaged the whole of the Sahel from the Atlantic to the Red Sea. Between 1931-1932 there was the "Doo izo jire"—the year of the locust larvae. There was a famine alert in 1937. Lastly, 1942 was the year of "Wandewaasu"—"Forget about your wife", so-called because everyone was thinking of saving his own skin.

It was by exacting such a heavy toll as this that the Sahelian system functioned. The economies of the northern and southern fringes complemented one another in a relationship favouring the stock-breeders. But when people began to tamper with systems of exchange and dependence of this type, they did not realize that this endangered the whole relationship between man and environment.

Although the landscape of the Sahel does not seem to have experienced anything more than localized modification in the last 50 years, the economic, social and political life of the Sahel has, on the contrary, undergone profound changes.

The most spectacular event was the end of hegemony by the Tuareg and the Maures. This conditioned subsequent events: a "modernization" policy, preceding then going hand in hand with the introduction of a money-economy. In this way the stage was set for keener competition for the different areas of the Sahel. The survival of the peoples involved seemed likely to hinge on their use and mastery of these regions.

One might summarize the situation at the beginning of this century on the southern edge of the Sahara and in the northern part of the Sahel as follows. Firstly, there was constant pressure by the nomads—whether Tuareg, Maure or Peul—on the sedentary population; the two groups certainly had peaceful contacts, but there were also many occasions when surprise attacks were carried out by the nomads.

The settled regions, inhabited by blacks, provided the stock-breeders with the millet which formed an indispensable part of their diet and with menial workers who were soon culturally assimilated. Furthermore, within the area usually inhabited by the nomads, the relations between the population and the environment were periodically adjusted by annual epidemics of diseases which man was then incapable of checking, by droughts and by wars between nomad groups which sometimes led to a redistribution of livestock and of captives from the southern part of the Sahel.

However, it would be wrong to present too schematic a picture. Tuareg and Maure societies each have their own kind of balance, some groups specializing in warfare, others forming marabout religious communities, with "captives" (servants) performing tasks such as guarding and watering the flocks, crop-growing in oases, and domestic work.

The Tuareg never seem to have practised more than a limited number of professions. This is still the case today: a survey of Tuaregs in the Tahoua area reveals that only two per cent of the population are craftsmen and less than 0.2 per cent are traders. The organization of the Peul groups, on the other hand, is quite different.

Tuareg hegemony over a large part of what is now Mali and Niger was challenged by the advance of colonial power. At first there was strong resistance, then in 1916-1917, a general uprising throughout the whole of the Tuareg country. This uprising was sternly put down, with the result that most of the families who held power were eliminated and the Tuareg confederations dissolved. The colonial era thus signified the reversal of the relationship based on force between the nomad herdsmen and the villagers.

From then on, the situation changed rapidly. Thus freed from the pressure exerted by the nomads, the black population of the south was able to extend the area under cultivation, encroaching further and further upon the herdsmen's traditional grazing lands, a process which in the long term was to have serious consequences.

The colonial power was in fact based on the areas populated by sedentary farmers; it protected them and recruited its auxiliaries from among them. It was the farming townships which received the administrative facilities set up by the colonial authorities and it was the sedentary peoples who got the lower grade administrative jobs, while the Tuareg, the Maures and to a large extent the Peul turned their backs on the schools set up by the French and the English, regarding them as institutions which led the young astray from Islam and helped to consolidate the influence of the foreign conquerors.

At the same time as relations between farmers and herdsmen were changing, profound transformations were also taking place within nomad societies. The relations between groups and families, already weakened by the measures taken by the colonial administration, tended to become weaker still. There was no longer the need, as before, to come together for purposes of attack or defence. New wells enabled certain groups to change their former grazing grounds and to move away from the rest of their kin.

The former prestige of the noble tribes and families was undermined. Distinctive changes took place within each group and within society as a whole the relationship between captives and their masters became looser.

Traditionally servants had been either those who looked after the cattle and gradually managed to build up their own herd, or those who did the household chores for the master's family, acted as guards or, in the case of women, fetched water, collected seeds of wild plants, etc.

The colonial authorities however, abolished serfdom and the nomads' servants gradually became aware of their rights. Some of them took a long time to decide to leave their masters and set up on their own with few means of subsistence, but gradually more and more former captives left the nomad camps, usually settling in the south.

Tuareg society, which had already suffered at its apex, was thus slowly undermined at its base. The traditional pastoral economy was left with a declining work force and the "true" Tuareg found themselves with fewer and fewer men to guide and guard their herds. However, there was only a slight drop in the number of livestock of most Tuareg families.

The total number of livestock for a group of three households living more or less interdependently must consist of a herd of 11 to 20 camels and from 50 to 100 cattle. But it should also be made clear that the livestock are unequally distributed between the different herdsmen.

There are hardly any groups of herdsmen without animals of their own. Individuals without possessions of their own often have to be absorbed into households which have a herd. Nearly a third of nomad groups, however, have no more than 10 camels and/or 50 cattle, while one tenth of all such groups have as many as from 40 to 90 camels and/or 200 to 600 cattle. Thus although they lost their power, the Tuareg kept or built up again herds of by no means negligible size. To a certain extent, therefore, they gained from the "development policy" applied in the Sahel.

(1) André Salifou. "Crise alimentaire au Niger: les leçons du passé." (Food crisis in Niger: the lessons of the past.) Formation pour l'Environnement (Training for the Environment.) Niamey, 1974.

SANDSTORM sweeps over a Tuareg camp in a semi-arid area on the borders of the Sahara. The strong wind whips up clouds of sand but is no match for the nomad tents firmly anchored to the ground. Mortars for grinding millet are seen on far left and far right of photo. Tiny thorn bush in foreground is a favourite forage for camels.

Photo Christine Spengler © Sipahioglu, Paris

PASTORAL ROUND. A shepherd leads his flock to the well at an oasis in Mauritania. The coming and going of livestock between watering points and grazing land patterns the daily round of the pastoral community.

Photo Henri de Châtillon © Rapho, Paris

DESERT CARGOES OF SALT

The transport of salt is a major activity of the caravans which ply within the vast region stretching from Mauritania to Ethiopia. The rock salt they carry is found in natural deposits in the Sahara, the Sahel and Ethiopia. Lower photo, opposite page, shows workers prising loose the crust of salt at Lake Assale in the Danakil depression, Ethiopia. The salt is sliced into blocks, or "loaves", and then transported by camel caravans (left) across the Sahel and the desert, for sale in oases and markets (below) or is often bartered for millet. Because of this transport over long distances, the salt sometimes fetches more than 20 times its cost price when sold at market.

Photos Georg Gerster © Rapho, Paris

sahel

3. the 'outsiders'

on the trail to progress

THE policies of the colonial period were fraught with ideological and practical contradictions. For one thing, currency was given to the myth of the noble shepherd—Tuareg or Peul—while at the same time the authorities extolled the black farmers.

Certain measures were taken to help the herders by sinking wells and building a few nomad schools, but simultaneously their "refuge" areas were reduced by encouraging smallholders—servants or freed captives—to settle there or by systematically peopling the inland delta of the Niger River.

A careful study would no doubt show that an "anti-pastoral outlook" usually predominated, and this became even more pronounced with the advent of independence.

In the first place, there was a tendency to look upon the nomads with suspicion. They were as reluctant to accept the new institutions as they had been the previous ones. They seemed elusive, arrogant, undisciplined and more interested in their cattle than in the territorial limits of their new countries. In short, they were poor citizens.

Secondly, nomad problems were customarily viewed through sedentary eyes. By and large, policies were defined and then applied by people who were under the impression that the rains came every year without fail.

The striking feature of policies with regard to the Sahel is the large measure of continuity from colonial times down to the present, except that in the post-independence period measures to enable the population to survive the difficult years have often been overlooked.

Former pastoral policies were mostly continued after independence by the various governments concerned and were implemented in the different Sahelian countries along quite similar lines. Wells were dug along the nomad trails and commercial routes, and they were equipped with pumping stations to replace the manpower of captives used in days gone by.

Administrative rules and regulations for stock-raising were introduced in some parts, defining forbidden areas and fire-protection zones, though these regulations were usually not respected. Similarly, almost everywhere the burning of grasses was forbidden but this prohibition too had little effect.

Water-holes offer the advantage of providing ample water, in some cases without requiring any special installation, and also of opening trails to new pastures. But the herds tended to flock more and more round such watering places and ruin the surrounding land. Over-grazing and trampling killed off the vegetation and contributed to topsoil erosion.

Thus the water-hole produces a desert in its own vicinity. This means that daily food must be sought farther and farther away, thereby increasing constantly the distance between the pasture and the watering point. The option is then either to let the herds die of thirst amid rich grazing lands, or die of hunger near a well.

While the drilling of wells and the conservation of pasture lands have had both positive and negative effects, veterinary prophylaxis has been undeniably successful in this region. Cattle-plague and lung-plague have diminished in a spectacular way. The interstate campaign to wipe out cattle-plague has led to a great increase in the number of cattle, followed by rational stock-farming, which has resulted in social problems and a shortage of animal fodder due to over-grazing.

It soon became apparent however that the very success of certain aspects of the "modernization" policies in the Sahel was going to spell disaster.

The likelihood of failure was all the greater because little thought had been given to the training needed to match the changes that were taking place. The expansion of education scarcely touched the northern Sahel, and where it did produce some results its effect was mostly to drain off the "élite". Once these people succeeded in their studies, they hardly ever returned to their area of origin.

Furthermore, here as elsewhere, what the schools proposed was a fictitious environment, modelled on that of the developed countries, and they trained young people for the life of city bureaucrats rather than for mastery of their own surroundings.

This is undoubtedly an essential aspect of what has happened in the Sahel. The gradual advance of a money economy, the drilling of new wells and the improved techniques in veterinary medicine all form part of a "development" philosophy aimed at bringing the Sahel peoples into the circuit of the dominant economic system, without any accurate estimate of the real risks involved in achieving such "progress".

Neither before nor after independence was there any attempt to ask a number of vital questions: Who makes a profit from the outflow of the Sahel's production and the distribution of certain products consumed by the nomads and farmers of this region?

Harvest time in the Sahel

The cultivation of millet plays a major part in the rural economy of the Sahel. Grown by sedentary farmers (photo opposite page shows heads of millet ready for harvest), millet is sold or bartered for meat and milk provided by nomad herdsmen (see also page 22). Above, a farmer digs holes in which to plant millet seeds. Top photo, harvesting millet in Niger. Tall millet stalks preserve fertility of topsoil by protecting it against wind erosion.

Photos © J.F. Schiano, Paris

What proportion of these profits is reinvested in the region to its benefit, what proportion leaves the region, especially for Europe—or else remains in the hands of the urban population?

How, for example, should one view the increasingly widespread policy of encouraging the development of ranch-style stock-breeding? The fact that the task of "modernizing" the Sahel is divided between a number of different bodies makes it quite easy to avoid posing questions of this kind.

The environment is rarely considered as a whole. The people are only taken into account as one factor among many. Technical success—the rapid increase in the numbers of the Sahel's livestock—obscures some highly disturbing facts. Remoteness, compartmentalization and failure to appreciate the complexity and interdependence of the various physical, social and economic factors of the nomad's life and environment have long characterized action taken with regard to stock-raising in the Niger Bend area of the Sahel. Efforts to develop this area, whether taken by colonial officials or by national leaders since independence, have thus been predestined to failure and disappointment.

The objective of development plans has often been an increase in the number of cattle without devoting sufficient attention to the age-old organization of pasture-lands, the control exercised by the herdsmen themselves over the number of animals grazing on any one area and the proper use of watering places.

Options have generally been determined by calculating profits on the basis of principles worked out in the industrialized countries in response to needs that were quite different.

While the technocrats were often oblivious of the defects and dangers implicit in these Sahelian policies, the nomads and many farmers were perfectly aware of them. It is not surprising that stock-breeders were loath to accept the directives of the public authorities.

In the Menaka region, for example, the installation of a number of "modern" watering spots produced a paradoxical reaction among the nomad herders: they would not alter their "pastoral calendar" and even refused

Photo © J.-F. Schiano, Paris

Millet is the staple diet of the Sahel's nomads and settled farmers. But a diet of millet alone can cause severe and even fatal malnutrition and must be supplemented with proteins (milk and meat). Right, typical millet granary found in the villages of Zerma farmers in the neighbourhood of Niamey (Niger). The dome-shaped structure of plaited millet stalks is raised on wooden piles to keep out rodents and insects. Yet grain losses from village granaries are of the order of 5 to 10 per cent, according to FAO experts.

to pasture their herds in the area where these new wells had been drilled.

New trails were opened up in the Gourma region by drilling wells where there were "no customs to upset", but "the project met with indifference and even suspicion on the part of the Gourma nomads towards government intervention in the pasturing of their herds."

In one sense the herdsmen benefitted from what the State did, including its health campaigns, especially through vaccination, which brought a sharp drop in cases of measles and smallpox. But on the other hand, the herdsmen see some State action as an interference in the way they like to roam with their cattle and an attempt to force them into commercialization.

A fact which is often overlooked, yet which has been responsible for the transformation of the Sahel and Sahara belts in the last two decades, is the rise of speculative stock-breeding. brought on primarily by the rapid growth of the large coastal towns.

There are three main aspects to the emerging trend: the proportion of cattle in the herds has risen; efforts have been made to increase the size of herds more rapidly; the sale of animal products has been greatly expanded.

Thus the Sahel, and particularly the area in the bend of the Niger River, has become the meeting-place for a "backward" system of animal husbandry and a system more directly integrated in the prevailing economic circuit.

Most of the Tuareg practise the first system. Their salient characteristics are their attachment to traditional values, their desire to increase the size of their herds (but not necessarily with the idea of selling the animals) and their preference for barter in their business deals.

On the other hand, a market-type system of stock-breeding is found among the Diawambé cattle dealers, the sedentary Songhai cattlemen and some of the Bousous who have become sedentary.

The persistence, among the Tuareg especially, of an attitude that leaves little room for contact with a money economy does not by any means imply stagnation or unprogressiveness in that society. On the contrary, there are many signs of change. "From contact with the farmers, his neighbours and trading partners to the south, the nomad herdsman of the Niger Bend has learned to consume more and discover new needs.

"Women have been the first victims of this confrontation between two ways of life which differ in their approach to production and consumption. Tuareg women have the greater share of responsibility for the running of the household. Even when they do not work they manage the family budget and either provide for or decide about daily expenses.

"To judge by the demand for jewellery, fabrics and trading-company products, they are currently playing an active role in the change-over now taking place in a 'pastoral community.'" (1) New consumption patterns are developing among the Tuareg today, largely because economic relations have an increasingly monetary character.

Barter has long been the practice throughout the Sahel. Historically it has not been very advantageous for the small farmers since it was carried on in such a way that they could obtain meat and milk but could not form herds of their own.

After the struggle between the herdsmen and those who worked the land died down, and the generation of those who remembered it had passed away, the nomads had to agree to what they had resisted for so long: to trade off their heifers for sacks of millet or maize and allow the farmers to build up their own livestock.

Thus the Tuareg lost their virtual monopoly over cattle-raising, and in many places the sedentary folk were the ones who henceforth set the terms of exchange. In this way money came into general use and caused a break with the old system of barter.

Everyone living in the Sahel area, for that matter, has felt the effects of a trading economy and the system of setting aside part of the agricultural production. This fraction of the herd and harvest which must be sold in order to pay taxes and purchase such goods as tea, sugar, cloth, blankets, etc. is constantly increasing.

Most of the Sahelian peoples have suffered from the depreciation in value of livestock and millet in relation to taxes and manufactured articles; the nomads have watched their livestock depreciate in relation to the price of millet. Thus the nomads are subject to a twofold exploitation: first, when they pay taxes and buy certain imported goods, and second, when they trade their animals for millet.

However, this type of exploitation scarcely affected the nomads' particular way of life as long as climatic conditions were normal. In addition, modernization encouraged some increase in the number of livestock, and this compensated to a small extent for the deterioration of terms of trade.

But the growth of a money economy introduced into Sahelian life factors whose effects were to boost trade and draw off profits more systematically from the herdsmen's resources.

The increase in the circulation of money and the possibility of organizing trade networks over long distances, based on livestock which could be bought for "reasonable prices" were to encourage some livestock-dealers to venture as far as the seasonal refuges and trails used by the nomads.

These new networks appear to have been operating for just over ten years. From 1962 to 1967, for example, "livestock traders from the upper delta of the Niger travelled north into the Gourma, where they settled along the river." (1) These traders were mainly Diawambés, traditional livestock dealers, along with some Sarakolés. They all quickly adapted to the special conditions of sedentary livestock rearing in the Niger valley.

One result of this intrusion by newcomers has been an urgent demand for paid herdsmen, either specialized or unskilled, in the livestock-rearing areas of the Niger Bend. More and more shepherds, from the Bobo and in some cases the Sarakolé peoples, are receiving money for their work.

The emergence of new types of relations between "antiquated" stock-breeding and speculative stock-breeding, and new forms of exchange relations, have led to keener competition for land in the Sahel.

First of all, there has been the movement of black farmers into the dry agricultural area. They need more land not only because they double in population every thirty years, but also because in addition to their subsistence crops they cultivate groundnuts and cotton.

But it might well be asked whether or not this extension of the cultivated area has to a large extent been wasteful. "Even before the drought reached alarming proportions, farmers were becoming increasingly careless about cultivating their fields: techniques were being abandoned or neglected; the tradition of organizing mutual aid by farmers was disappearing; and migrants who were supposed to return during the season to cultivate their land did not always do so. All the evidence indicates that the farmers were cultivating areas that were too large, and doing it badly." (2)

The pioneer belt is not only being occupied by farmers from the south, however, and by villages which were already there and have expanded. In the intervening areas that remain, the Bousous have set up their huts and tents and are tilling the soil extensively. They are able to live on a bit of grain, wild fruits and plants, and when they have a few animals, from the produce of this livestock. In any case, the nomads and transhumant herdsmen do not have such free access to the stubble and fallow fields as they once did.

What is still more serious for the herders is the closing off of areas where water is available. These areas have either been fenced off with hedges to protect alluvial crops cultivated in the vicinity of pools, river banks and basins that have been more or less developed, or they are being ▶

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(1) Ba Sayon Fofana. "L'élevage bovin dans la boucle du Niger." (Cattle raising in the Niger Bend). Faculté des Lettres et Sciences humaines, Rouen, France, March 1974.

(2) Yveline Poncet. "La sécheresse en Afrique Sahélienne." See footnote page 11.

absorbed by the expanding cultivation of rice.

Places which are still accessible to the herds are quickly over-grazed. The grass disappears and it is hard to revive it. Villagers are increasingly inclined to deny the herders access to refuge areas, and the leaner their harvest, the more reluctant they are to tolerate strangers in the vicinity.

Thus it is difficult for the nomads to move from place to place with their animals and they find themselves partly excluded from the best areas.

"Cultivation of irrigated land is being increased to the detriment of pastures. This is confirmed by such signs as the increasing number of clashes between stock-breeders and farmers over seasonal grazing grounds and by the much shorter time spent by livestock in the valley." (1)

These restrictions and the gradual pushing back of the herdsmen create new problems. Some of the nomad groups have been forced to migrate farther to the north. It is estimated that from 1940 to 1970 the northernmost limit of the area traversed by the Peul nomads shifted upwards from the 15th parallel to the 18th, a distance of more than 200 km.

This drive northward has been made with Bororo zebus—tawny cows with a high hump and horns in the form of a lyre—which is the breed these herdsmen prefer, though at this latitude it is slightly outside its normal ecological setting since it is heavier and less resistant than the Azavaq cows raised by the Tuareg.

Furthermore, the Peul herds are largely made up of cattle, whereas the Tuareg herds are more diversified and thus take better advantage of pasture-lands, because sheep and goats can graze on plants that cattle leave behind. It is not surprising therefore that the Bororo livestock has suffered more from the effects of exposure to prolonged drought.

In any event, the introduction of this specialized breed has placed an additional strain on the already overworked pastures and has also led to an excessive consumption of resources, particularly wild cereals which might have served to feed human beings had the livestock not got to them first.

Naturally, this intrusion has brought about conflict with the Tuareg in the area. The most serious consequence of the expansion of the sedentary people and the nomad's northward thrust has been the upsetting of the traditional use made of grazing ranges and watering points. On the one hand, in the southern part of the Sahel and in the refuge areas, newcomers have appeared with livestock whose numbers regularly increase ; on the other, various groups of the nomads themselves are encroaching on pasture-land which is not traditionally theirs.

Customs and agreements regarding the use of routes and wells "are disappearing under the combined pressures of new cattle-owners and the State's re-allocation of pasture-lands." (1) Groups which had dug their own wells and managed them have now had to relinquish control over the organization of their grazing land. After being dispossessed politically, they are now being dispossessed economically, and this has created particular hardship for Tuareg families.

One extremely serious matter is the fact that a well may be drilled for anyone who requests it. This does away with all control by the traditional assemblies and territorial chiefs, while at the same time the "modern" regulations and laws are not enforced very strictly. In reality, the cattle-raisers' geographical freedom of movement is what leads to the disorganization of the pasture lands.

The authorities did in fact attempt to replace this custom with other regulations. But in most cases their move was not well received by the stock-breeders.

Nevertheless, after the first few years of drought, numerous herders changed their attitude. Rather than be totally excluded from some areas, they sometimes preferred to abide strictly by the decisions that had been taken. Yet even if, at that stage, an attempt had been made to reorganize the Sahel region, it would already have been too late.

The determining factor here—which is the result of irregular rains—is the shortening or disappearance of the period of active plant growth. Thus certain grasses that need large amounts of water adapt to drought conditions but put forth one or two blades instead of five or six. Vast areas have completely lost their grassy carpet and the soil is painfully dry.

The average length of the Senegal acacia leaf decreased from 34.3 mm in 1971-1972 to 24.7 mm in 1972-1973. Fruit production has shown an even greater decline : only one tree out of six is bearing fruit two years in a row. Still more alarming was the death of a large percentage of trees and shrubs in 1972-1973. Over half the Senegal acacia trees died off in that period.

The drought has had harmful consequences, but the Sahel has also been badly damaged by the herders who have had no scruples about destroying or mutilating the remaining bushes and trees of the region in the hope of saving their animals.

These clumps of trees and thickets have had an extremely important function in the Sahel. For one thing, they formed tiny refuges that fostered the growth of plant and small animal life, and from which both could spread and recover the intervening ground. They also offered shade to the young domestic animals and protected the herders themselves from the torrid sun.

Cattle-raisers have suffered untold hardships from the drought. A succession of lean years up to 1972 debilitated the livestock and contributed to a higher mortality rate. Farmers were obliged to cut into the reserves that they kept for their subsistence or for sale.

Then came 1973 with its sparse and badly-timed rains. Dry crops gave a poor yield and irrigated ones did not produce what had been expected, since the large rivers, as well as small lakes and ponds, did not receive enough water to overflow their banks and allow the usual alluvial planting.

Pastures are indeed vanishing. Contrary to what normally used to happen, sheep and goats are now competing with cattle for the same grass and the same brush. Many wells and ponds are drying up. The reduction or disappearance of surface water has a direct effect on the herders and farmers because this is the water that is most readily accessible to them and that they can use with the techniques and devices at their disposal.

It is at the group level however that the breakdown of the environment has been having its most dramatic impact. The nomads, as we have seen, had adapted to their arid surroundings by moving from place to place and using the meagre resources that they encountered along the way.

The settlers adapted by using the available water to best advantage, by trying to reduce risks to a minimum through their system of cultivation, by storing several years' supply of grain for their own consumption, and occasionally by trading with the nomads. It was by dint of such expedients that the Sahelian peoples were able to protect themselves from the constant threat of famine.

This is no longer the case. The herds have grown, and extending the nomad range has not sufficed to provide the cattle with minimum food requirements. Wherever a bit of hay is still to be found, it is often far from the watering points whose immediate vicinity has been laid completely bare. Nomadism has thus ceased to play its time-honoured role in the Sahel.

Farmers, on the other hand, have been able to maintain their traditional system of agriculture, but crops such as peanuts and cotton have been introduced into the southern Sahel and have progressed dangerously towards vulnerable areas where they are upsetting the old practice of crop rotation.

By 1972 and 1973 the deterioration of the Sahelian environment and the displacement of the northern Sahel societies had entered a virtually irreversible phase. It became evident that the herds had grown too large.

In 1972, the cumulative effects of

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(1) Ba Sayon Fofana. "L'élevage bovin dans la Boucle du Niger."

previous bad years caused a disparity between the size of the flocks and herds and the extent of the remaining pasture land which was this time irremediable.

The press of cattle round certain wells was so great that they dried up. The distance between watering points that had not run dry, and between these and grazing areas that could still be used, increased to such an extent that the weakened, thirsty beasts could scarcely cover it. And by now the refuge areas, too, were failing in their function.

But how large were the herds when the Tuaregs decided to undertake their exodus? Was their size really that important? Perhaps the fact that nearly all the horses and two-thirds of the asses had died off was not so serious. What alarmed the herdsmen more than this was the loss of over half of their camels and goats, along with 40 per cent of their cows.

In addition to these numerical losses, the value of livestock is dropping from day to day. Cattle products were already depreciating as compared with the produce of the settled peoples.

Exchange rates plummeted and the herders were the losers. After three years of cereal-crop failure an 80 kilogramme sack of millet was selling at the town of Gao, in April-May 1972, for between 5,000 and 20,000 Malian francs, whereas a cow was worth only 1,000 Malian francs, a heifer 3,000 and a calf 450.

Photo Alain Nogués © Sygma, Paris

Photo © J.-F. Schiano, Paris

Photo © Salgado

Three words—water, pasture, millet—sum up the whole basis of life in the Sahel. Drawing on reserves of grain, farmers are better placed than nomad herdsmen to weather periods of scarcity and even serious drought. Centre photo, a Hausa villager in Niger grinds millet in the shadow of a thatched hut (right of photo); cylindrical granaries topped with straw (left of photo) are stocked with millet for the dry season. Even in drought-free periods, the nomad faces the uncertainty of water supplies. Photo right, taken before the disastrous years of 1973-1974, shows Tuareg herds waiting near a well for their turn to drink. Top photo, efforts are now being made to re-seed Sahel pastures that became completely barren and eroded.

sahel

4. twenty thousand

Photo © Claude Sauvageot, Paris

arrived but no one knows how many started out

PURSUED by hunger and drought, the nomads sooner or later came to a halt somewhere—at a spot where a few refugees had already drifted, close to some locality where at least they could beg and find something to drink. Sometimes food distribution centres were set up where these little groups of people had formed. News got around, and other wanderers began to gather.

A good many Mali nomads arrived at the Lazaret camp, close to Niamey, after making their way down either bank of the Niger. A series of gulleys and branch channels of rivers also lead in the direction of the capital of Niger. Understandably, those in search of water and hoping to find grazing land in the damper regions followed these routes.

Some also felt that only in a major city could they hope to receive a little help.

As a result the few groups that had settled in Niamey, on the outskirts of the Lazaret camp, as early as 1973, swelled rapidly. Their numbers jumped suddenly from 4,000 to 6,000 between November and December. In January 1974 this figure climbed to 10,000 and in February it passed the 12,000 mark. The high point of 22,000 was reached in August 1974.

One has the impression that the Lazaret camp contains only the remnants of families. "None of the families at the Lazaret at the present time is complete. We don't know if our relatives who stayed behind are going to join us here, or whether we shall return to try to find them."

The composition of one family from Gao is disturbing: six men aged between 30 and 65, and only one woman over 15. Surely these men are married. But where are their wives? Elsewhere, we find eleven adults (over 15 years old) with only six children between them, none of whom is less than five years old. What has happened to the others?

These survivors of drought and famine are today packed together on an almost treeless plateau, swept by a sand-laden wind where there is only one dispensary and a few Zerma huts.

The moral and physical wretchedness of these conditions weighs heavily on the nomads. Water is available, but in niggardly quantities. And what most upsets these refugees in the camp are the smells and the flies and "the worms that suck our blood".

There is little to be gleaned from the surrounding countryside: a few broken boughs and, with a bit of luck, some millet stalks to build a shelter. Yet four households out of five gather

Photo Georg Gerster © Rapho, Paris

The Tuareg find ready-to-hand all the materials they need to produce the fittings and furnishings for their tents : poles and posts, curtains of fibre matting and animal hair carpets with traditional designs which keep the cold and sand at bay (photo above). Beneath the tents, the Tuareg unfold beds like the one shown below, its solid feet and frame carved with skill and artistry. Strips of matting, here rolled up ready to be carried, are used as screens against the wind. Among the Wodaabe, a group of the Peul nomads, the women usually carry furnishings and utensils on their heads. Opposite page, a Tuareg woman from Niger.

Photo © J.-F. Schiano, Paris

brushwood to make cooking fires. A quarter of the families also use millet straw. Customarily in their home regions, the nomads used dried animal dung as fuel, but here only one in twenty does so since there are hardly any animals left to produce it.

The majority of nomads have nowhere to shelter or to sleep on arrival. Most of their tents, cushions and blankets have been sold, or sometimes simply abandoned when there were no more animals left to carry them. Virtually the only exception to this are the Wodaabe, whose women are used to carrying on their heads household utensils and sometimes even pieces of wood for use as bed frames.

Almost all the nomads have had something to eat daily since their arrival in Niamey. Not that the distributions have necessarily provided everyone with an adequate ration, but at least these distributions have been systematic and regular.

Yet the nomads are haunted by the fear that one day these handouts may cease. When asked what they worry about most, half of them reply: food.

At the end of January 1974, there were 400 graves in the camp cemetery. But now that the hardships of the exodus are over, one can say that fewer people are dying at Lazaret.

To cope with this swarm of refugees from Niger and other countries, in such a desperate state of malnutrition and sickness, obviously poses a tremendous problem.

Nevertheless, in the month prior to the survey at the camp, half the families had at least one member receiving medical treatment. As for malnutrition, this is serious, but perhaps less so than one might have feared. The worst hit are already dead.

The first signs of an awakening, of a desire on the part of the nomads to take their fate in their own hands are now appearing in the camp. For the moment only a very small minority has reacted in this way but the new attitude nevertheless led the refugees to make some basic improvements in the camp early in 1974.

About that time seven schools were opened, while a women's action group also got down to work. These first steps taken by the nomad refugees towards reorganizing their surroundings may well mark the end of their attitude of resignation.

They are now utterly cut off from their original surroundings and way of life. In the past the meat and milk they obtained from their livestock provided their daily food and also served as a means of exchange against millet. From the hides and the fleeces of their animals they made harnesses, water-skins, tents and clothing. Even the animals' dung was used as fuel.

Now, however, food is brought from far away in planes or lorries, along with blankets and clothes. Waste materials and packing cases from the town are used for building huts or as fuel for cooking.

Formerly, the risk of uncertain food supplies was a problem which the people of the Sahel coped with on their own with varying success. Today attempts are being made to solve it through international aid. For the links binding the human group to its Sahel environment as well as those binding the human group itself have snapped simultaneously.

All that remains today is the debris of a people, exposed to misery, reduced to depending upon assistance from others.

For those nomads who have lost their flocks, the situation remains bleak. "They are totally uprooted, facing unknown horizons in a land whose language they do not speak. Nothing remains of their former environment, neither their dwellings (though they have occasionally managed to build makeshift homes from materials such as cardboard or jerrycans) nor their eating habits.

"There are no more pack animals left. Men face the long and arduous task of learning to work as labourers or as craftsmen, changes their caste-based society would never have tolerated under normal circumstances. So refugee families now depend upon charity and public goodwill, both of which are unpredictable, and on any menial tasks others may give them (fetching water, hewing wood or grinding millet...)." (1)

Camp-life first strikes the nomad refugee as unfamiliar and bewildering. Many of those in the camp sink into an apparently bottomless gloom. But most of them dream. Among adult refugees, five out of six told us of their day-dreams. One head of a family group told us he "dreamed only of famine". Others dream of "the lorry which comes to distribute food". Many look back over their former lives: "We dream of having our animals and of living in the bush as we used to."

Should they stay or should they leave? What do the refugees really think about this vital question? Some of them want to return to their homeland. "We want to go back home if we can have the means; the day we have something to hold on to... If I could, I'd stay there forever. If I could live in my own land, I wouldn't want to be anywhere else."

But only ten per cent of the nomads are thinking of returning, so these viewpoints are somewhat exceptional.

The most widespread feeling is that the Tuareg nation has been forced to migrate *en masse* and that it is going to have to find a new land for itself.

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(1) Yveline Poncet. "La Sécheresse en Afrique Sahélienne." See footnote page 11.

But there is another, by no means unimportant aspect: the psychological shock from which these nomads now seem to be suffering. They claim they are being exploited, and particularly in economic terms: they say they are not given enough millet in exchange for their livestock in the markets of Mali. As a result their purchasing power as stockbreeders is constantly declining.

Others complain that when they make enclosures of thorn bushes in order to keep calves from their mothers, they are accused of uprooting protected shrub species and are fined. They also protest that they are forced to pay an exorbitant tax every time they want to dig a new well.

Whether or not these allegations are true is less important than the degree to which the Tuareg believe them to be so, and the need to clearly understand the implications of this state of mind. What many refugees feel about this flight in the face of drought may well have political repercussions.

These are men and women who, in the final analysis, are seeking not merely a drop of water and a mouthful of food, but also peace of mind, a haven, a place where as a people they may once more hope to exist.

When parents see no future for themselves in the region they have left, they draw the logical conclusion and begin to hope for another way of life for their children.

Many of them see which way the times are moving; they see that animals are no longer productive. "We don't want our children to become nomads", they say, "now we can see that a settled life is better than a nomadic one."

Generally speaking, about a third hope to see their children following in their footsteps and taking up the same occupation. One head of family in six says this depends on their being able to build up big enough herds. All the same, a little over half of all the nomad refugees don't want to see their children ending up as herdsmen.

This means that the new generation will need a different type of education from that given to the previous one.

AID BY AIRLIFT AND DESERT CONVOYS

A massive international programme of emergency aid has channelled food, tents, blankets and medical help by land, air and sea to the peoples of the Sahel afflicted by drought and famine. Top right, like ants in the giant bowl of sand and sky, a convoy of relief trucks halts briefly in the Sahara en route from England to Niger. Regular airlifts have brought food and equipment to the stricken African region. Right, Tuaregs greet a transport plane from Belgium on its arrival in Niger. Belgian planes alone in 1973-1974 logged 1,755 flying hours and flew a total of 700,000 km to bring in over 5,000 tons of relief cargoes.

Photo Tom Sheppard © Camera Press, London

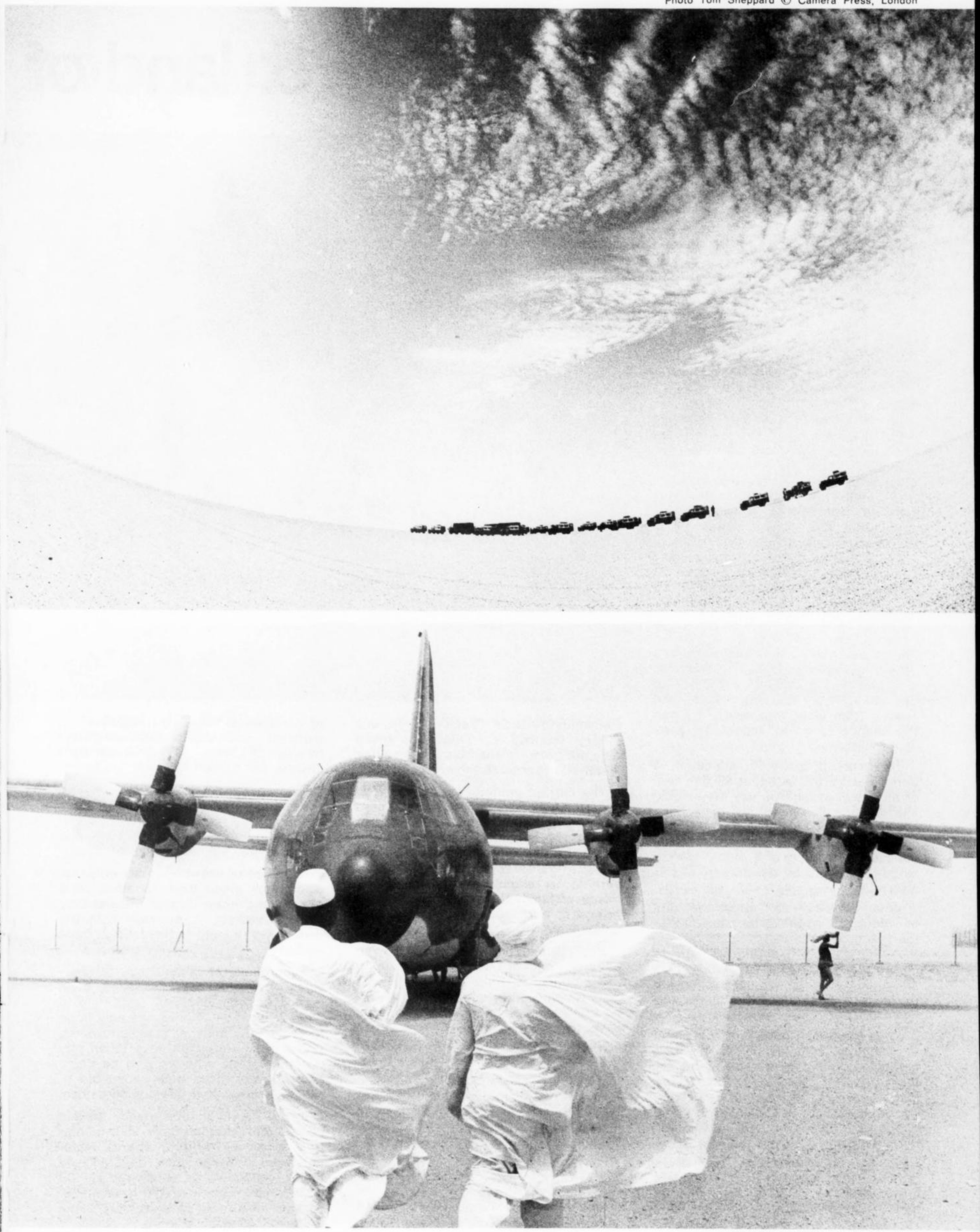


Photo Jean Guyaux © Sygma, Paris

sahel

5. land of

Right, lessons for Sahel refugee children at an improvised school in a relief camp near Niamey (Niger). The refugees spontaneously set up seven of these schools in the camp early last year. Now cut off from their homeland, the vast majority of parents in the camp see schooling as the key to a new life for their children. Opposite page, Tuareg shepherds of Tassili in southern Algeria, where high cliffs (background) have been sculpted into fantastic shapes by wind and rain.

Photo David Burnett © Gamma, Paris

THE exodus suddenly improved the standing of the few refugee children who somehow or other had previously managed to obtain a little schooling. They came into contact and began to communicate with peoples from other ethnic groups. Above all, they found themselves in the best position to get the maximum from those bringing aid, by serving as interpreters, or—most coveted of tasks—acting as go-betweens when food supplies were being distributed.

The nomads soon realized that these children stood the best chance of finding relatively well-paid work and of fitting into modern life. Some of the adults too would welcome an opportunity of learning, like one Tuareg from Gao, who said, "If I had the chance to go to school, I'd jump at it."

This marked desire for education is borne out by the fact that 96 per cent of all heads of families say they would like their children to go to school. But what kind of schooling should they have? The refugees themselves firmly believe that mastery of a widely-spoken language should be a vital part of this education.

What do they think about the kind of values that ought to be passed onto the rising generations? Some believe the child himself ought to choose his future way of life: "Once he's educated, it's up to the child to decide which qualities he thinks are important."

Does this mean parents are drawing the logical conclusions from their present inability to provide food for their offspring and to exercise their authority? Or are they merely becoming aware that nomad values are going to be of little use in urban life? Perhaps both.

So the education being envisaged for the children thus marks a complete break with the dreams and hopes of their elders. In other words, the Tuareg have given up all thought of transmitting their traditional values through education. Does this mean they are going to abandon these values in other aspects of their lives?

The current attitude of the nomads towards the marriage of their daughters is somewhat surprising. One head of family out of ten demands that the suitor be Muslim, while one in five will not consider a blacksmith or a servant as eligible. Nearly half the heads of family, however, seem ready to accept just about anyone as a son-in-law.

But some consider that "even poverty cannot justify abandoning one's principles", like one family from Gao which is only prepared to marry its children to those descended from a Marabout (holy man). "Even a rich man could not marry a daughter of mine", says the head of this family.

However, this is not a widely held view. Most of the nomads are perfectly aware of the consequences of their altered situation upon matrimonial choices. "Before, I only gave my daughters in marriage to Muslims. Now, I would marry my daughter to anyone who brought us food."

Some heads of family avoid taking up a stand in the face of this collapse of traditional Tuareg attitudes to marriage and leave their daughters freedom of choice. "The woman must choose for herself."

There are signs that the Tuareg have broken with the image they formerly had of themselves. "Nowadays, they are afraid of the bush, and the townspeople make fun of them."

Many refugees feel that only religion now binds them together as a group, and that through Islam they have something in common with the population among which they have settled.

Subordinate or dependency relationships have practically collapsed, even though certain "captives" still cling to their masters as offering the only hope of protection; in other cases, however, servants or craftsmen have taken pity on their former masters who, to begin with at least, have been incapable of any task other than that of herdsman.

In the test of dire need, certain nobles and freemen have shown their true worth by sharing scarce water and food between their children and their "captives". But many, at the point where sharing would have meant certain death for themselves, have preferred survival.

no return?

Photo Jean-Dominique Lajoux © Rapho, Paris

Life in the camp has brought with it a mixing of all classes, and the social hierarchy is tending to be reversed. The markets in the towns enable cobblers, blacksmiths and jewellers to sell their wares more profitably than in the camps. "Captives", accustomed to heavy labour, are better equipped than others to render services to country or townsfolk in the settlement area.

Mutual help among families was a normal practice in the Sahel; survival depended on it and it was one of the rules governing social relations.

At the Lazaret, 44 per cent of the refugees say that no other family has helped them in their everyday life, while 47 per cent also say that they do not help anyone. In fact, for half the refugees the rule is now "every man for himself".

To begin with, families now hide a good many things from their neighbours, especially job possibilities, meetings with people who may be able to help them, or a little bit of extra food they may have been able to scrounge. Often, refugees hide under a shelter or a tent to secretly eat food a child or an adult has managed to beg.

A person or family suspected of having anything more than the rations distributed is immediately besieged by relatives, servants or neighbours, who sit around and demand a few scraps.

The main reason why social links are broken is that people are no longer in a position to fulfill their social and economic obligations. Before the drought, many heads of family gave their protection and certain benefits in exchange for work and respect. Now, they have no flocks to look after and they are incapable of protecting and feeding their family and dependents. There is no longer any basis for respect, nor does it have any meaning.

This then is what seems to be happening to Tuareg society. It has been driven to disintegration, first by defeat at the beginning of the century, then by the introduction of a money-based economy, and finally by drought and famine.

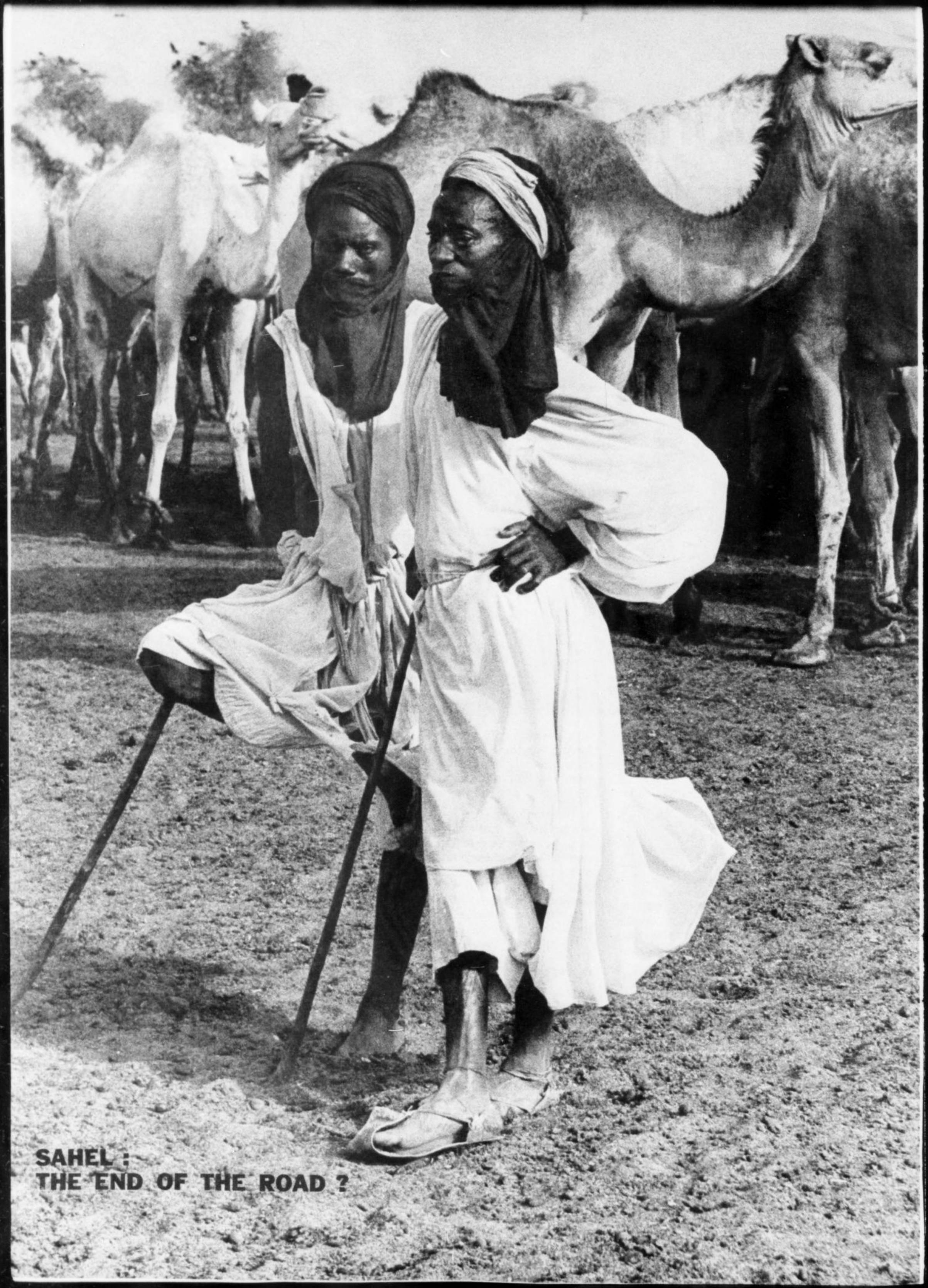
Confederations, tribes, groups and families have been broken up and only a few vestiges of the old solidarity remain. The dominant trend at the present time is for everyone to try to get by as best they can. Behaviour born of famine continues to predominate even though food supplies are now reaching the refugees regularly.

As well as being biologically shattered, Tuareg society has also broken down socially and culturally. Who is going to write Tifinar, the alphabet of Tamasheq, the Berber dialect spoken by the Tuaregs, in future? And how many children are going to live (if they do survive) in a society where Tamasheq will be understood?

Even so, this collapse is not total. Some people seem to be showing a determination to escape their situation as persons dependent on aid. And not all refugees have thrown their traditional values overboard.

What is perhaps most important of all is that the refugees should continue to think of themselves as a human and cultural entity—not as a nation with territorial claims.

What has happened in the Sahel has not passed unnoticed in Africa or in the world at large. The consequences of the drought have undoubtedly been brought home to a section of the élite in the affected countries, leading them to examine the human and economic aspects of the disaster in depth and to reappraise the policies applied in the Sahel before the drought as well as the way in which it was tackled. ■



SAHEL : THE END OF THE ROAD ?

Letters to the Editor

GYPSY LANGUAGE AND CULTURE

Sir,

As a teacher at the first British Gypsy Council Caravan School of 1967, I was delighted to see the article by Arthur R. Ivatts on the new horizons opened by education for the Romany peoples ("Unesco Courier", November 1974), illustrated by some of my friend Josef Koudelka's marvellous photographs. It is particularly good that the question is now being recognized as international, and that the Rom and their friends can reach out for a new understanding across the barriers of national frontiers.

The National Gypsy Education Council, which is the national body in the United Kingdom representing the views of Gypsy parents and teachers, has been saying since 1970 that "the Romany culture is rich in tradition and can make a positive contribution to the life and work of any school."

I am slightly worried, however, that the "Advisory Committee for the Education of Romanies and other Travellers", the voluntary group with which Arthur Ivatts is associated, remains so opposed to any use of the Romany language in education in Britain, and to the participation of Gypsy parents in educational policy formation.

Could not Unesco, as it has been several times requested by national and international organizations, assist in the development on an international scale of literature and materials for use in Romany and Traveller Education, and do something to encourage the blossoming work of the novelists and poets who have begun to appear among the new educated strata of Romany society?

T.A. Acton
Honorary Secretary
National Gypsy Education Council
London, U.K.

MAN AND THE BIOSPHERE

Sir,

Paying high tribute to your magazine in general, I should like to single out the January 1973 issue devoted to the preservation of the biosphere. I think that your magazine should consistently, interestingly and scientifically deal with these problems, to make everyone understand that he or she and nature are indivisible.

Metaphorically man is the most beautiful flower on earth, the most beautiful star in the sky, the most splendid water in the ocean. You should make upcoming generations feel the joy and splendour of life in unity with nature, by devoting as much space as possible to the preservation of the biosphere.

Tofik Safarov
Baku, Azerbaijan, U.S.S.R.

UNIVERSAL STANDARDS AND MEASUREMENTS

Sir,

Speaking at the General Assembly of the International Standards Organization (ISO) a few years ago, Mr. A. Sundralingham, scientific and technical adviser on the U.N. Economic Commission for Africa (ECA), said that to achieve a universal system of measurements is a task of the highest priority, in which ISO, U.N. and Unesco can render invaluable assistance to the developing nations.

The all-round improvement of merchandise quality is a major problem whose solution would in particular raise the efficiency of production. Experience has shown that standardization is an effective instrument of control over merchandise quality. It is a catalyst of industrial development and is called upon to play a special role in the developing countries.

During the past four years the U.S.S.R. State Committee for Standards has been holding, in Moscow, seminars combined with practical training in standards, metrology and merchandise quality control. The seminars have been attended by trainees on U.N. fellowships from Asia, Africa, Latin America and Europe. The classes are given by experts from the U.S.S.R. Committee for Standards. Some 80 persons—engineers, technicians, etc.—from 26 countries have already taken the course.

Trainees study methods and practice of standardization in relation to output quality control in certain industries and in regard to interchangeability and the fundamentals of metrology.

Practical training is carried out at industrial plants and research centres, at laboratories dealing with strength, vibration, friction, wear and corrosion and also at metrological laboratories in many parts of the U.S.S.R.

In February 1972, speaking at a seminar in Vienna for the directors of such courses, Mr. Ibrahim Abdel Rahman, Executive Director of the United Nations Industrial Development Organization (UNIDO), praised the activities of the Moscow training course and said that its work should be better known.

Standardization training plays an important role in bringing peoples closer together, as well as promoting industrial development and economic progress.

V.M. Ogryzkov
V.P. Kochin
U.S.S.R. Standards Committee
Moscow, U.S.S.R.

A 'MODERN' GENIUS OF THE RENAISSANCE

Sir,

Your special issue on the rediscovered manuscripts of Leonardo da Vinci (October 1974) is an important contribution to our knowledge of the life and work of the great Florentine artist, whose versatile genius touched on every aspect of human activity more than 500 years ago.

Leonardo imagined and drew mechanisms which are still used today. Most of his designs have found a practical application in machines of many kinds, and above all in motor vehicles. The mechanisms and elaborate machines drawn by Leonardo, such as brake levers, connecting rods, pinions, cog wheels, transmission systems, ball bearings, dredgers and cranes would have worked in his lifetime had a sufficiently powerful motive force been available.

But the most remarkable thing about Leonardo is his "modern" philosophical approach. He seems more like a 20th-century man than a man of the Renaissance. His restlessly creative mind ranged far beyond what was possible in his own time, but posterity has drawn on many of his ideas and given them practical form.

Juan Martin Gastelu
Director, "Nueva Era" magazine
Buenos Aires, Argentina

SAVING OUR SITES AND MONUMENTS

Sir,

It is always a pleasure to read in the "Unesco Courier" articles on the world's great treasures of art. One can appreciate your concern for the preservation of ancient monuments, as outlined in your issue of December 1974, dealing with the heritage of Nepal and the 15 cities around the world which are launching major preservation operations.

In this context it would be interesting to know what kind of solution has been found to save the splendid ancient city of Venice in Italy and how much restoration has been completed already.

Thank you for the extremely valuable work you are doing for the whole of humanity and, in a personal context, for giving me hours of reading pleasure.

Linda E. Spacek-Jung
New York, U.S.A.

Editor's note: The "Unesco Courier" has published numerous articles on the preservation of monuments in Venice, particularly in its issues of January 1967 and December 1968, the latter being entirely devoted to this subject.

THEY CALL US 'HANDICAPPED'

Sir,

Congratulations on your issue "They Call us 'Handicapped'" (March 1974), which makes stimulating reading. It was of particular interest to me as editor of "Mook-Dhwani", a publication of the All India Federation of the Deaf.

I should like to publish in my magazine some of the articles which appeared in your issue. I wonder, too, whether you know of an original article on noise hazards in industry and the deaf in industry which I could use in a special issue on "Industry Speaks"?

R.L. Bhat
New Delhi, India

Editor's note: The "Unesco Courier" published a special issue dealing with "Noise Pollution" (July 1967) including the health hazards of excessive noise.

WINDOW ON THE WORLD

Sir,

I am a regular reader and enjoy your magazine very much. Each new number is, as you so rightly style it, a window open on the world!

Maleria Mlyniec
Warsaw, Poland

Photo Jean Guyaux © Sygma, Paris

BOOKSHELF

RECENT UNESCO BOOKS

■ **Three Centuries of Scientific Hydrology.** Key papers submitted on the occasion of the celebration of the Tercentenary of Scientific Hydrology, Paris, September 1974 (with abstracts in English, French, Spanish and Russian). 123 pp.

■ **Science and Technology in African Development.** (Science Policy Studies and Documents, No. 35), 1974, 238 pp. (28 F)

■ **The Basic Secondary School in the Country: an Educational Innovation in Cuba,** by Max Figueroa, Abel Prieto, Raul Guitierrez. 1974, 47 pp. (7 F)

■ **New Trends in the Utilization of Educational Technology for Science Education.** 1974, 247 pp. (35 F)

■ **An Experiment in the Ruralization of Education: IPAR and the Cameroonian Reform,** by Raymond Lallez. Study prepared by the International Bureau of Education. (Experiments and Innovations in Education, No. 8), 1974, 113 pp. (12 F)

■ **Anatomy of an International Year: Book Year—1972.** 1974, 37 pp. (6 F); **Mass Media in Society—The Need of Research.** 3rd impression, 1974, 33 pp. (6 F); **Radio and Television in Literacy,** by John Maddison. 2nd impression, 1974, 82 pp. (10 F) (All three published in Unesco's "Reports and Papers on Mass Communication" Series)

OTHER BOOKS

■ **Protection of Human Rights in the Light of Scientific and Technological Progress in Biology and Medicine.** Proceedings of a round table conference organized by the Council for International Organizations of Medical Sciences (CIOMS) with the assistance of Unesco and the World Health Organization. Distributed by WHO on behalf of CIOMS, 1974, 384 pp. (31 Sw. F)

■ **Designing Freedom,** by Stafford Beer. John Wiley and Sons, London, 1974, 100 pp. (£2.95)

■ **Platform for Change,** by Stafford Beer. John Wiley and Sons, London, 1975. (£5.00)

■ **Readings in Glass History, No. 4.** The part played by Southern Syria and the Jews in the transfer of the glass industry to the Western world. Selected and edited by Anita Engle. Phoenix Publications, Jerusalem, 1974, 90 pp. ($4.00)

■ **Redesigning the Future: A Systems Approach to Societal Problems,** by Russell L. Ackoff. John Wiley and Sons, London, 1974, 260 pp. (£5.95)

UNESCO NEWSROOM

Unesco medal commemorates Michelangelo anniversary

To mark the 500th anniversary of Michelangelo's birth (March 1475) Unesco has issued reproductions of a medal bearing the great artist's portrait and executed in 1561 by his contemporary, the Italian sculptor Leone Leoni. Proceeds from the sale of the medal will be channelled through the Unesco gift coupon programme to the "Centre Voltaique des Arts" (Volta Arts Centre), Ouagadougou, Upper Volta, for the benefit of young African artists. Above is the obverse side of the medal with its portrait bust of Michelangelo. The medal, which is available in gold, silver and bronze, can be obtained from Unesco's Philatelic Service, Place de Fontenoy, Paris 75700, France.

Radio and TV versus illiteracy

Educational broadcasters from 20 Arab states met recently in Kuwait at a Unesco-sponsored meeting to study the best ways of using radio and TV in literacy and adult education campaigns and how to fit educational broadcasts into current school programmes. Similar regional meetings are planned for Asia and Africa later this year, and for Europe and Latin America in 1976.

Unesco mobile exhibits on Oceanic art

Unesco travelling exhibitions on Oceanic art will shortly be circulating in a number of countries, as part of Unesco's programme for the study of Oceanic cultures, launched in 1971. Other recent activities in the programme include recordings of music from the Solomon Islands (in Unesco's anthology of "Musical Sources") and a bibliography on oral Oceanic traditions prepared by the University of Auckland (New Zealand).

500,000 students abroad every year

Some half a million students are studying abroad every year, most of them on scholarships, grants and other forms of financial aid. Unesco's best-seller, "Study Abroad" which has just appeared in its 20th, completely revised edition (see inside back cover) offers the world's most complete listing of foreign studies, scholarships, courses and general information for student travellers. The majority of the world's students abroad are in a dozen principal "host countries": U.S.A. (140,000 foreign students), France (35,000), Fed. Rep. of Germany (34,000), Canada (31,000). U.K. (27,000), Lebanon (21,000), Italy (18,000), U.S.S.R. (17,000), Egypt (14,000), Argentina (12,000), Japan (11,000), Spain (10,000), Switzerland (10,000).

Cyclone-proof paper houses

Houses built of paper and resin are best suited to withstand cyclones according to an Australian architect, Prof. Steven Winter. He suggests the application of honeycomb-type structures—used in aircraft bodies to withstand great pressure—to produce virtually indestructible houses. Paper, in the shape of accordion pleats, is coated with resin, stretched out and heat moulded to panels of gypsum, plyboard or other cheaply available material. The technique has been used in over 3,000 houses, hospitals and factories at a cost far lower than for conventional building.

$1,000,000 donation from Saudi Arabia for Unesco projects in the Sahel

Saudi Arabia has donated $1,000,000 to finance Unesco aid projects in seven Sahel countries: Chad, Gambia, Mali, Mauritania, Niger, Senegal and Upper Volta. Following a decision by the late King Faisal, $1,000,000 was presented on March 28, 1975, to Mr. Amadou-Mahtar M'Bow, Director-General of Unesco, by Mr. Hamad Al Khowaiter, Permanent Delegate of Saudi Arabia to Unesco. The money goes to Unesco's Funds-in-Trust programme for the support of educational activities in various countries outside Unesco's regular budget.

U.S.S.R. plants in peril

The U.S.S.R. Botanical Centre is publishing a special "red book" listing nearly 600 endangered plant species in the Soviet Union. Plants in peril include Korean and Siberian cedars, European and Far Eastern yew trees and various medicinal plants. Livestock and deforestation are two culprits named for current destruction of flora.

Flashes...

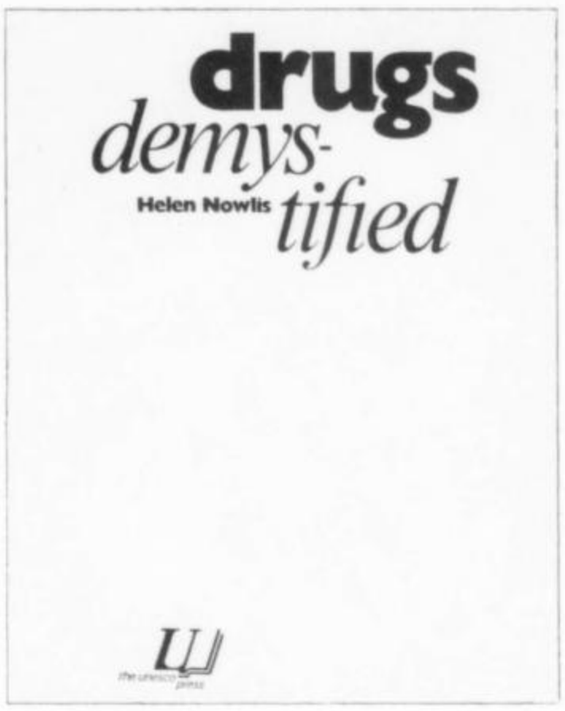
■ *Grenada became Unesco's 136th Member State on February 17, 1975.*

■ *The International Foundation for Science (IFS), recently established in Sweden, will help developing countries to train their own scientists and develop research, through grants to enable young scientists to undertake research projects in their own countries.*

■ *Unesco-sponsored Book Development Centres are being set up in 1975-1976 in Cairo for the Arab States and Yaounde (Cameroon) for Africa. Book Development Centres will then exist in all the developing regions.*

■ *Countries of northern Europe have far more cases of heart disease then those of southern Europe, reports WHO. The incidence of heart attacks is five times greater in Helsinki than in Sofia.*

Imp. Presses de l'Unesco Paris. — Dépôt légal C 1 — Avril 1975. — Imprimé en France (Printed in France).



92 pages 6 Francs

■ Based on data collected by Unesco, this booklet for parents and teachers discusses different drugs, types of drug users and social factors contributing to problems of drug use and abuse.

■ Its author, Helen Nowlis, psychologist and Director of the Drug Education Office, U.S. Dept. of Health, Education and Welfare, reviews the various attitudes to drug abuse, examines the pros and cons of efforts at prevention and also challenges some preventive strategies currently employed.

Just published by Unesco

The latest edition of Unesco's international guide to study abroad — now 25 years old — covering the academic years 1975-1976 and 1976-1977.

■ Lists more than 200,000 study opportunities throughout the world, offered through international scholarships or courses.

■ Comprises fellowships, travel grants, courses and other study arrangements offered or administered by over 2,000 international organizations and national institutions in nearly 130 countries.

■ Gives easy-to-use information on who can study, what subject and where, details of the award, how and where to apply. An index of fields of study is included for the first time. The latest edition of "Study Abroad" costs no more than the previous one.

523 pages 24 Francs
Composite: English-French-Spanish

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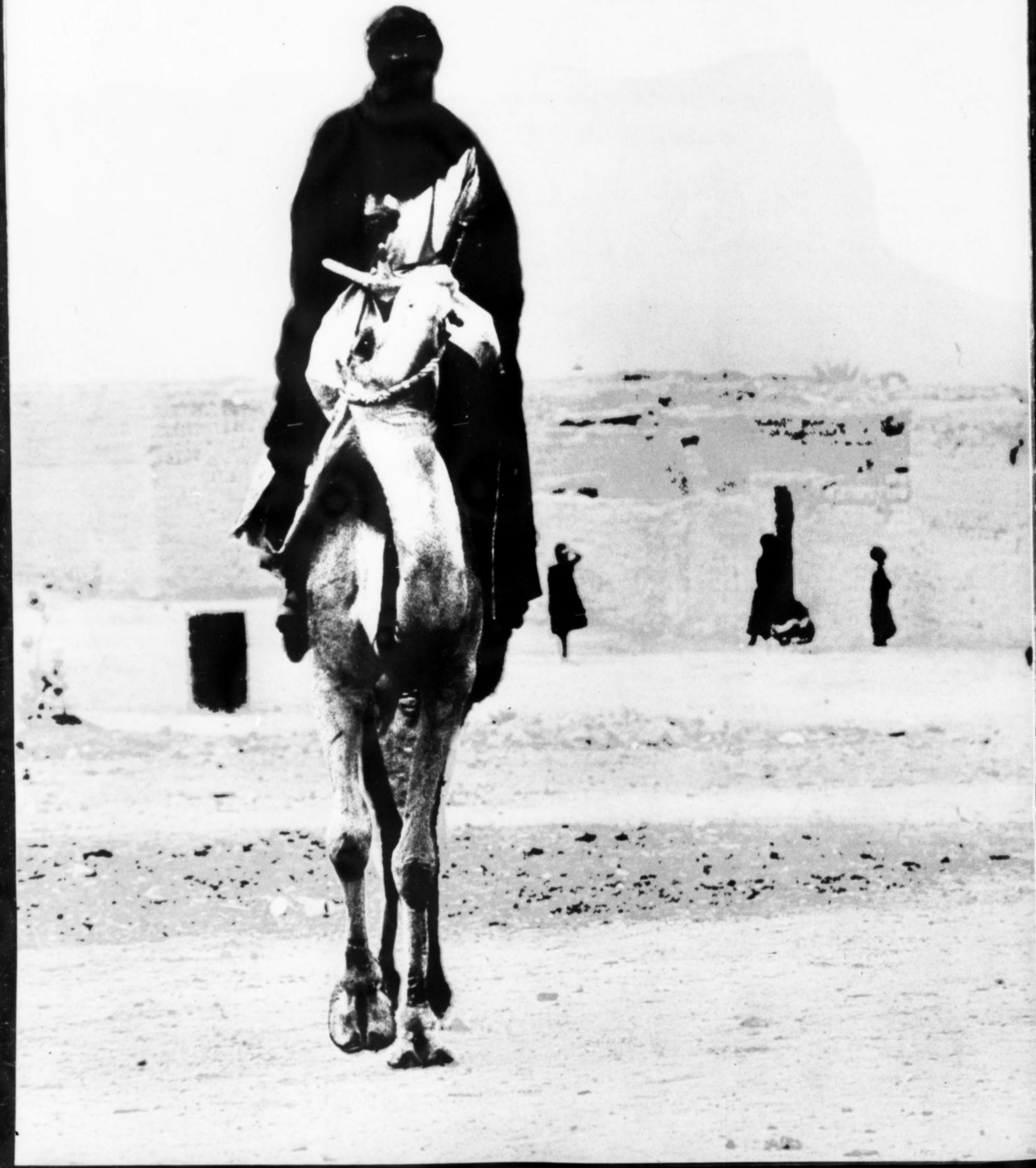
LORDS OF THE DESERT

Beast of burden, provider of milk and wool for clothes and tents, the camel has for 2,000 years been the pillar of the desert economy for the nomads who roam the Sahara and its borders. With its unique ability to go without water for days or even months, the camel can live where sheep and cattle would not survive. Caravans of camels still wend their way along a vast network of desert trading routes (see photo report, pages 18 and 19.) Here, a nomad sits proudly astride his camel in the Hoggar region of southern Algeria.

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